SOIL SURVEY OF

Holmes County, Florida

United States Department of Agriculture
Soil Conservation Service
In cooperation with
University of Florida
Agricultural Experiment Stations

Major fieldwork for this soil survey was done in the period 1963–1971. Soil names and descriptions were approved in 1971. Unless otherwise indicated, statements in the publication refer to conditions in the county in 1971. This survey was made cooperatively by the Soil Conservation Service and the University of Florida Agricultural Experiment Stations. It is part of the technical assistance furnished to the Holmes Creek Soil and Water Conservation District.

Copies of the soil map in this publication can be made by commercial photographers, or they can be purchased on individual order from the Cartographic Division, Soil Conservation Service, United States Department of Agriculture, Washington, D.C. 20250.

HOW TO USE THIS SOIL SURVEY

THIS SOIL SURVEY contains information that can be applied in managing farms and woodlands; in selecting sites for roads, ponds, buildings, and other structures; and in judging the suitability of tracts of land for farming, industry, or recreation.

Locating Soils

All of the soils of Holmes County are shown on the detailed map at the back of this publication. This map consists of many sheets made from aerial photographs. Each sheet is numbered to correspond with a number on the Index to Map Sheets.

On each sheet of the detailed map, soil areas are outlined and are identified by symbols. All areas marked with the same symbol are the same kind of soil. The soil symbol is inside the area if there is enough room; otherwise, it is outside and a pointer shows where the symbol belongs.

Finding and Using Information

The "Guide to Mapping Units" at the back of this survey can be used to find information. This guide lists all the soils of the county in alphabetic order by map symbol and gives the capability classification of each. It also shows the page where each soil is described and the page for the woodland suitability group in which the soil has been placed.

Individual colored maps showing the relative suitability or degree of limitation of soils for many specific purposes can be developed by using the soil map and the information in the text. Translucent material can be used as an overlay over the soil map and colored to show soils that have the same limitation or suitability. For example, soils that have a slight limitation for a given use can be colored green, those with a moderate limitation can be colored yellow, and those with a severe limitation can be colored red.

Farmers and those who work with farmers can learn about use and management of the soils from the soil descriptions and from the explanation of the capability units and the woodland groups.

Foresters and others can refer to the section "Use of the Soils for Woodland," where the soils of the county are grouped according to their suitability for trees.

Game managers, sportsmen, and others can find information about soils and wildlife in the section "Use of the Soils for Wildlife."

Community planners and others can read about soil properties that affect the choice of sites for dwellings, industrial buildings and for recreation areas in the section "Use of the Soils for Recreational Development."

Engineers and builders can find, under "Engineering Uses of the Soils," tables that contain test data, estimates of soil properties, and information about soil features that affect engineering practices.

Scientists and others can read about how the soils formed and how they are classified in the section "Formation and Classification of the Soils."

Newcomers in Holmes County may be especially interested in the section "General Soil Map," where broad patterns of soils are described. They may also be interested in the information about the county given at the beginning of the publication and in the section "General Nature of the County."

Cover: **General farming in area that is dominantly the Dothan-Ardilla soil association. At left-center are gently sloping Dothan soils, which are generally suited to cultivated crops if erosion is controlled. The dominant trees are slash pines.**

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Issued June 1975

SOIL SURVEY OF HOLMES COUNTY, FLORIDA

BY JULIUS L. SULLIVAN

HERBERT H. WEEKS, ERNEST M. DUFFEE, BUSTER P. THOMAS, HAROLD C. AMMONS, AND M. L. HARRELL, SOIL CONSERVATION SERVICE

UNITED STATES DEPARTMENT OF AGRICULTURE, SOIL CONSERVATION SERVICE, IN COOPERATION WITH UNIVERSITY OF FLORIDA AGRICULTURAL EXPERIMENT STATIONS

HOLMES COUNTY is in the northwestern part of Florida (fig. 1). It has a total land area of 483 square miles, or 309,120 acres. Bonifay, the county seat, is in the southeast corner of the county.

Most of the soils in the county are nearly level, gently sloping, or sloping. These are sandy or loamy soils, and generally, they are suited to farming. The climate is favorable for most crops because of the long growing season and the mild winters.

Farming is the major source of income in the county. Peanuts, corn, soybeans, watermelons, vegetables, pasture grasses, and small grain are the principal crops. Pulpwood and sawtimber are valuable products of the forest, which covers a large part of the county.

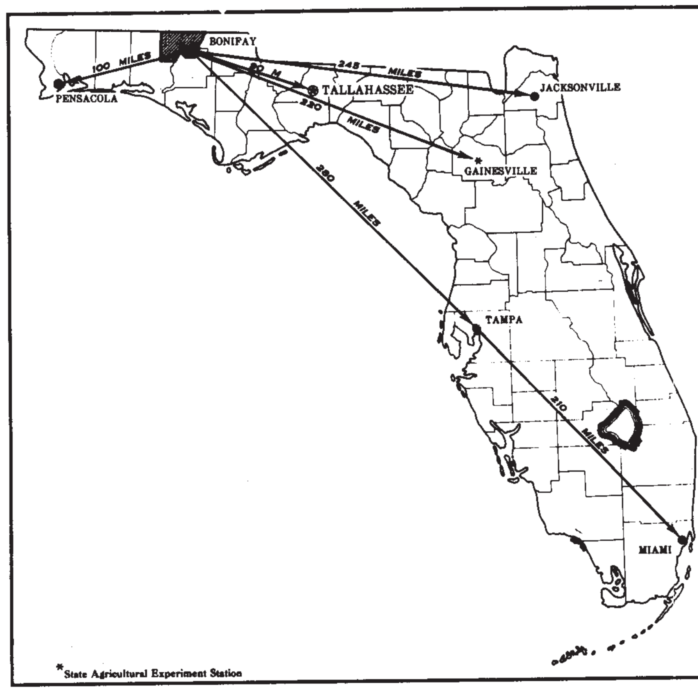

Figure 1.—**Location of Holmes County in Florida.**

How This Survey Was Made

Soil scientists made this survey to learn what kinds of soil are in Holmes County, where they are located, and how they can be used. The soil scientists went into the county knowing they were likely to find many soils they had already seen and perhaps some they had not. They observed the steepness, length, and shape of slopes; the size and speed of streams; the kinds of native plants or crops; the kinds of rock; and many facts about the soils. They dug many holes to expose soil profiles. A profile is the sequence of natural layers, or horizons, in a soil; it extends from the surface down into the parent material that has not been changed much by leaching or by the action of plant roots.

The soil scientists made comparisons among the profiles they studied, and they compared these profiles with those in counties nearby and in places more distant. They classified and named the soils according to nationwide, uniform procedures. The *soil series* and the *soil phase* are the categories of soil classification most used in a local survey.

Soils that have profiles almost alike make up a soil series. Except for different texture in the surface layer, all the soils of one series have major horizons that are similar in thickness, arrangement, and other important characteristics. Each soil series is named for a town or other geographic feature near the place where a soil of that series was first observed and mapped. Bibb and Dothan, for example, are the names of two soil series. All the soils in the United States having the same series name are essentially alike in those characteristics that affect their behavior in the undisturbed landscape.

Soils of one series can differ in texture of the surface layer and in slope, stoniness, or some other characteristic that affects use of the soils by man. On the basis of such differences, a soil series is divided into phases. The name of a soil phase indicates a feature that affects management. For example, Dothan loamy sand, 0 to 2 percent slopes, is one of several phases within the Dothan series.

After a guide for classifying and naming the soils had been worked out, the soil scientists drew the boundaries of the individual soils on aerial photographs. These photographs show woodland, buildings, field borders, trees, and other details that help in drawing boundaries accurately. The soil map at the back of this publication was prepared from aerial photographs.

The areas shown on a soil map are called mapping units. On most maps detailed enough to be useful in planning the management of farms and fields, a mapping unit is nearly equivalent to a soil phase. It is not exactly equivalent, be-

cause it is not practical to show on such a map all the small, scattered bits of soil of some other kind that have been seen within an area that is dominantly of a recognized soil phase.

Some mapping units are made up of soils of different series, or of different phases within one series. Two such kinds of mapping units are shown on the soil map of Holmes County: soil complexes and soil associations.

A soil complex consists of areas of two or more soils so intricately mixed or so small in size that they cannot be shown separately on the soil map. Each area of a complex contains some of each of the two or more dominant soils, and the pattern and relative proportions are about the same in all areas. The soil complex is named for the dominant soil. Dothan complex is an example.

A soil association is made up of adjacent soils that occur as areas large enough to be shown individually on the soil map but are shown as one unit because the time and effort in delineating them separately cannot be justified. There is a considerable degree of uniformity in pattern and relative extent of the dominant soils, but the soils may differ greatly one from another. The soil association is named for the dominant soils. Bibb association is an example.

While a soil survey is in progress, soil scientists take soil samples needed for laboratory measurements and for engineering tests. Laboratory data from the same kind of soil in other places are also assembled. Data on yields of crops under defined practices are assembled from farm records and from field or plot experiments on the same kind of soil. Yields under defined management are estimated for all the soils.

Soil scientists observe how soils behave when used as a growing place for native and cultivated plants and as material for structures, foundations for structures, or covering for structures. They relate this behavior to properties of the soils. For example, they observe that absorption fields for onsite disposal of sewage fail on a given kind of soil, and they relate this to the slow permeability of the soil or its high water table. They see that streets, road pavements, and foundations for houses are cracked on a named kind of soil and they relate this failure to the high shrink-swell potential of the soil material. Thus, they use observation and knowledge of soil properties, together with available research data, to predict limitations or suitability of soils for present and potential uses.

After data have been collected and tested for the key, or benchmark, soils in a survey area, the soil scientists set up trial groups of soils. They test these groups by further study and by consultation with farmers, agronomists, engineers, and others. They then adjust the groups according to the results of their studies and consultation. Thus, the groups that are finally evolved reflect up-to-date knowledge of the soils and their behavior under current methods of use and management.

General Soil Map

The general soil map at the back of this survey shows, in color, the soil associations in Holmes County. A soil association is a landscape that has a distinctive proportional pattern of soils. It normally consists of two or more major soils and at least one minor soil, and it is named for the major soils. The soils in one association may occur in another, but in a different pattern.

A map showing soil associations is useful to people who want a general idea of the soils in a county, who want to compare different parts of a county, or who want to know the location of large tracts that are suitable for a certain kind of land use. Such a map is a useful general guide in managing a watershed, a wooded tract, or a wildlife area, or in planning engineering works, recreational facilities, and community developments. It is not a suitable map for planning the management of a farm or field or for selecting the exact location of a road, building, or similar structure, because the soils in any one association ordinarily differ in slope, depth, stoniness, drainage, and other characteristics that affect their management.

The five soil associations in Holmes County are discussed in the following pages.

1. Dothan-Ardilla association

Nearly level to strongly sloping, well-drained and somewhat poorly drained soils that have thin layers of sandy material over a loamy subsoil; on ridges and side slopes

This association consists mainly of broad upland ridges that have long, gently sloping sides and of nearly level areas at lower elevations between the ridges. The drainage is in a well-defined system of branches and creeks that flow in a southerly direction. Slopes generally are less than 8 percent except in a few small areas mainly adjacent to streams.

This association makes up about 33 percent of the survey area. About 44 percent of it is Dothan soils, and 12 percent is Ardilla soils. The remaining 44 percent is minor soils.

Dothan soils are mainly nearly level and gently sloping and are on broad upland ridges that have long, gently sloping sides. Some areas are strongly sloping. These soils are well drained. They have a surface layer of dark grayish-brown loamy sand about 8 inches thick. The upper 5 inches of the subsoil is yellowish-brown sandy loam. The lower part is sandy clay loam that is yellowish brown to a depth of 40 inches. It becomes mottled as depth increases. The water table is at a depth of more than 72 inches.

Ardilla soils are nearly level and occur at lower elevations than Dothan soils. They are somewhat poorly drained. They have a surface layer of very dark gray loamy sand about 5 inches thick and a loamy sand subsurface layer about 4 inches thick. The upper 7 inches of the subsoil is light yellowish-brown sandy loam. The lower part is yellowish-brown sandy clay loam that is mottled in shades of brown, yellow, red, and gray. The subsoil becomes more highly mottled as depth increases. In wet seasons the water table is at a depth of about 15 to 20 inches for 2 to 6 months in most years.

The minor soils are mainly well-drained Fuquay, Gritney, Tifton, Faceville, Orangeburg, Troup, and Bonifay soils on upland ridges and poorly drained Bibb and Pansey soils, very poorly drained Pantego soils, and moderately well drained Stilson soils on stream bottoms, in depressions, and in other low places between the ridges.

Most areas of the Dothan soils are cultivated. These soils generally are suited to cultivated crops and are well suited to improved pasture grasses. If cultivated, the gently sloping and sloping Dothan soils need erosion control practices. The Dothan soils support good stands of pine. The

Ardilla soils are mainly used for pine production. They are suited to cultivated crops and improved pasture grasses, but some water-control practices are needed. Most of the minor soils that are well drained are suited or well suited to cultivated crops and pasture, but if these soils are cultivated some of them need erosion control practices. The minor soils that are moderately well drained are used mainly for pasture and woodland but are suited to row crops if they are properly drained. The minor soils that are poorly drained and very poorly drained and are on small stream bottoms or in depressions generally support a dense stand of water-tolerant trees, such as cypress and gum, many shrubs and vines, and in some places a few pines.

Most of this soil association is in owner-operated farms. Most farms range from 10 to 140 acres in size. Farm products include corn, peanuts, vegetables, watermelons, cattle, and hogs. Many families that maintain homes in this association derive their income from nonfarm sources.

2. *Fuquay-Dothan association*

Nearly level to sloping, well-drained soils that have thick or thin layers of sandy material over a loamy subsoil; on ridges and side slopes

This association consists of nearly level and gently sloping, broad upland ridges and sloping sides of ridges. The drainage is in a well-defined pattern and is made up of many small streams and creeks along which are narrow, wet bottom lands. Some low, nearly level and gently sloping areas are adjacent to the bottom lands.

This association makes up about 27 percent of the survey area. About 33 percent of it is Fuquay soils, and 21 percent is Dothan soils. The remaining 46 percent is minor soils.

Fuquay soils are on ridges and side slopes. They are well drained. They have a surface layer of dark grayish-brown loamy sand about 6 inches thick. The subsurface layer is yellowish-brown and brownish-yellow loamy sand about 27 inches thick. The upper part of the subsoil is brownish-yellow sandy loam and sandy clay loam about 24 inches thick. It has few to common mottles in shades of red, yellow, and brown. The lower part of the subsoil is mottled sandy clay loam that extends to a depth of about 88 inches. The water table is at a depth of more than 88 inches.

Dothan soils are on ridges and side slopes. They are well drained. They have a surface layer of dark grayish-brown loamy sand about 8 inches thick. The subsurface layer is yellowish-brown sandy loam about 5 inches thick. The upper 5 inches of the subsoil is yellowish-brown sandy loam. The lower part is sandy clay loam that is yellowish brown and mottled to a depth of 52 inches, but below this it is entirely mottled. The water table is at a depth of more than 72 inches.

About half the acreage of minor soils is the well-drained Bonifay, Gritney, Lucy, Orangeburg, and Troup soils. These soils are on ridges and side slopes. The other half is the very poorly drained Pantego soils, the poorly drained Bibb soils, the somewhat poorly drained Ardilla soils, and the moderately well drained Stilson soils. These soils are on bottom lands and in low areas adjacent to bottom lands.

Fuquay and Dothan soils generally are suited to cultivated crops and well suited to improved pasture grasses. They support good stands of pine. The minor soils that are poorly drained and very poorly drained generally have a dense stand of gum and cypress trees; the rest support good stands of pine; but those that are moderately well drained and somewhat poorly drained under natural conditions are suited to cultivated crops and pasture after they have been properly drained. The soils on the wet bottoms along streams and in depressions are not cultivated.

Most of this association is in woodland that is privately owned, but a small acreage is in owner-operated farms. Many family homes are maintained in this association, but most income is derived from nonfarm sources.

3. *Troup-Fuquay association*

Nearly level to sloping, well-drained soils that have thick to extremely thick layers of sandy material over a loamy subsoil; on ridges and side slopes

This association consists mainly of broad, nearly level and gently sloping upland ridges and long, sloping sides of ridges. Nearly level areas between the ridges consist mainly of long, narrow, small stream bottoms.

This association makes up about 8 percent of the survey area. About 34 percent of it is Troup soils, and 20 percent is Fuquay soils. The remaining 46 percent is minor soils.

Troup soils are on ridges and side slopes. They are well drained. They have a surface layer of dark grayish-brown sand about 5 inches thick. The subsurface layer is brown, yellowish-brown, and yellowish-red sand that extends to a depth of about 58 inches. The upper 8 inches of the subsoil is red sandy loam that has few reddish-yellow streaks. Below this, the subsoil is red sandy clay loam that has few yellowish-brown mottles and extends to a depth of 83 inches. The water table is at a depth of more than 83 inches.

Fuquay soils are on ridges and side slopes. They are well drained. They have a surface layer of dark grayish-brown loamy sand about 6 inches thick. The subsurface layer is yellowish-brown and brownish-yellow loamy sand about 27 inches thick. The upper 24 inches of the subsoil is brownish-yellow sandy loam and sandy clay loam that has few to common mottles in shades of red, yellow, and brown. The lower part of the subsoil is mottled sandy clay loam that extends to a depth of about 88 inches. The water table is at a depth of more than 88 inches.

Among the minor soils are the well-drained Orangeburg, Lucy, Bonifay, Fuquay, and Faceville soils and the excessively drained Lakeland soils. These soils are on upland ridges and sides of ridges. Other minor soils are the poorly drained Bibb soils, the somewhat poorly drained Albany and Ardilla soils, and the moderately well drained Chipley and Stilson soils. These soils are on small stream bottoms and in low-lying areas between upland ridges.

Most of this soil association is woodland. The Troup soils support natural stands of mainly scrubby oaks and a few longleaf and slash pines. They are moderately suited to cultivated crops and are suited to improved pasture grasses. The Fuquay soils are mainly in pine trees, but they are suited to cultivated crops and are well suited to improved pasture grasses.

Most of the association is owned by paper companies, but some of the acreage is owned by private individuals. Very few families maintain homes in this soil association.

4. *Pantego-Stilson association*

Nearly level and gently sloping, very poorly drained and moderately well drained soils that have moderately thick

or thick layers of sandy material over a loamy subsoil; in depressed areas and on ridges

This association consists mainly of nearly level, swampy, depressed areas and broad, low, gently sloping upland ridges. Some of the depressions have poor outlets and become ponded.

This association makes up about 19 percent of the survey area. About 32 percent is Pantego soils, and 23 percent is Stilson soils. The remaining 45 percent is minor soils.

Pantego soils are in nearly level, swampy, depressed areas. They are very poorly drained. They have a surface layer of loamy sand that is black in the upper part and very dark gray in the lower part. It is about 13 inches thick. The subsoil is gray sandy clay loam that has few to common mottles in shades of gray, yellow, and brown. It extends to a depth of 62 inches. The water table is at a depth of 0 to 15 inches for 9 to 12 months in most years. Many areas are frequently ponded with shallow water.

Stilson soils are on broad, low, gently sloping upland ridges between streams and low, swampy areas. They are moderately well drained. They have a surface layer of dark grayish-brown loamy sand about 5 inches thick. The subsurface layer is light yellowish-brown loamy sand about 20 inches thick. The upper 20 inches of the subsoil is brownish-yellow sandy loam and sandy clay loam. The lower part is mottled sandy clay loam that extends to a depth of 68 inches. The water table is at a depth of 30 to 40 inches for 1 to 2 months in wet seasons in most years.

Among the minor soils are the well-drained Fuquay, Dothan, Troup, and Lucy soils and the excessively drained Lakeland soils. These soils are on upland ridges. Other minor soils are the poorly drained Bibb and Pansey soils, the somewhat poorly drained Ardilla soils, and the moderately well drained Angie soils. These soils are along small stream bottoms, in depressions, and on broad, low ridges.

Most of the association is woodland. Some areas of the Stilson soils are used for improved pasture, and a few small areas are cultivated. The Stilson soils are suited to cultivated crops and improved pasture grasses, but some water-control practices are needed. The Pantego soils and the poorly drained minor soils generally are covered by a dense stand of cypress, gum, and other water-tolerant hardwoods.

Most of this association is privately owned. The main farm products are corn, watermelon, cattle, and hogs. Few families maintain homes in this association, and most income is derived from woodland products, such as pulpwood and sawtimber. Many families derive their income from nonfarm sources.

5. Bibb association

Nearly level, poorly drained soils that are loamy throughout; on flood plains

This association is on bottom lands and terraces of the Choctawhatchee River, Holmes Creek, and Wrights Creek. It consists of many long and narrow depressions that parallel streams and terraces slightly above the streams. The depressions generally have poor drainage outlets and are ponded much of the time. The broad, low, nearly level areas that are on the terraces at lower elevations are frequently flooded for several days. The terraces at higher elevations are seldom flooded.

This association makes up about 13 percent of the survey area. About 45 percent is Bibb soils. The remaining 55 percent is minor soils.

Bibb soils are on nearly level bottom lands along streams. They are poorly drained. They have a surface layer of very dark gray sandy loam, about 10 inches thick, that grades to dark gray in the lower part. The subsoil is gray sandy loam that has a few yellowish-brown and light-gray mottles and extends to a depth of 60 inches. The water table is within a depth of 15 inches of the surface for 6 to 12 months each year. Some minor, unclassified, very poorly drained soils that are shallowly ponded most of the time are associated with these Bibb soils. Also associated are some better drained soils at higher elevations; these soils have a subsoil of sandy clay loam that has thin lenses of coarser textured soil material. This part of the association corresponds with the Bibb association of soils mapped in the detailed part of the survey.

Among the minor soils are the well-drained Kenansville, Maxton, Troup, Dothan, and Fuquay soils and the excessively drained Lakeland soils. These soils are on the terraces at higher elevations and on adjacent uplands that finger in and out of some parts of the association. Other minor soils are the moderately well drained Angie and Stilson soils, the somewhat poorly drained Ardilla and Albany soils, and the poorly drained Pansey soils. These soils are on broad, nearly level to gently sloping, low ridges that finger in and out of some parts of the association.

Nearly all of this association is woodland. A few small areas of minor soils adjacent to the uplands are cleared and used for pasture. The Bibb soils are unsuited to cultivated crops, but they support good stands of cypress, gum, poplar, and some pine trees.

Much of this land is owned by private individuals, but a large acreage is owned by paper companies. Very few families maintain homes in this association.

Descriptions of the Soils

In this section the soils of Holmes County are described. Each soil series is described in detail, and then, briefly, the mapping units in that series. Unless it is specifically mentioned otherwise, it is to be assumed that what is stated about the soil series holds true for the mapping units in that series. Thus, to get full information about any one mapping unit, it is necessary to read both the description of the mapping unit and the description of the soil series to which it belongs.

An important part of the description of each soil series is the soil profile, that is, the sequence of layers from the surface downward to rock or other underlying material. Each series contains two descriptions of this profile. The first is brief and in terms familiar to the layman. The second is much more detailed and is for those who need to make thorough and precise studies of soils. The profile described in the soil series is representative for mapping units in that series. If a given mapping unit has a profile in some ways different from the one described in the series, these differences are stated in the description of the mapping unit, or they are apparent in the name of the map-

ping unit. Color terms are for moist soil unless otherwise stated. The description of each mapping unit contains suggestions on how the soil can be managed.

Following the name of each mapping unit is a symbol in parentheses. This symbol identifies the mapping unit on the detailed soil map. Listed at the end of each description of a mapping unit is the capability unit and woodland group in which the mapping unit has been placed. The capability unit and woodland group in which the soil has been placed can be learned by referring to the "Guide to Mapping Units" at the back of this survey.

The acreage and proportionate extent of each mapping unit are shown in table 1. Many of the terms used in describing soils can be found in the Glossary, and more detailed information about the terminology and methods of soil mapping can be obtained from the Soil Survey Manual (*8*).[1]

Albany Series

The Albany series consists of gently sloping, somewhat poorly drained soils that formed in thick beds of sandy and loamy marine sediments. These soils are on low upland ridges.

In a representative profile the surface layer is dark-gray sand about 6 inches thick. The subsurface layer is about 39 inches thick. The upper 16 inches of this layer is light yellowish-brown sand, and the lower 23 inches is brownish-yellow sand that has light-gray and yellow mottles. The subsoil begins at a depth of about 45 inches. The upper 7 inches of the subsoil in brownish-yellow sandy loam that has light-gray, yellow, and yellowish-brown mottles. The lower part, extending to a depth of 65 inches, is sandy clay loam that is mottled with yellow, brownish yellow, light yellowish brown, yellowish brown, strong brown, very pale brown, and light gray.

The available water capacity is very low in the upper 45 inches and moderate below this depth. Permeability is rapid to a depth of about 45 inches, moderately rapid between depths of 45 and 52 inches, and moderate below a depth of 52 inches. Natural fertility is low.

[1] Italic numbers in parentheses refer to Literature Cited, p. 59.

Representative profile of Albany sand, 0.5 mile east of State Highway No. 79 and about 3.0 miles south of Bonifay in the NW¼NW¼ sec. 18, T. 4 N., R. 14 W.:

A1—0 to 6 inches, dark-gray (10YR 4/1) sand; single grained; loose; common fine roots; few clean sand grains; strongly acid; gradual, wavy boundary.

A21—6 to 22 inches, light yellowish-brown (10YR 6/4) sand; few, medium, faint tongues of gray (10YR 5/1) extending along root channels; single grained; loose; few fine roots; strongly acid; gradual, wavy boundary.

A22—22 to 36 inches, brownish-yellow (10YR 6/6) sand; few, fine, faint mottles of light gray; single grained; loose; few fine roots; sand grains dominantly coated with oxides; strongly acid; gradual, wavy boundary.

A23—36 to 45 inches, brownish-yellow (10YR 6/6) sand; common, medium, faint mottles of light gray (10YR 7/2) and yellow (10YR 7/8); single grained; loose; sand grains dominantly coated with oxides; strongly acid; gradual, wavy boundary.

B1t—45 to 52 inches, brownish-yellow (10YR 6/6) sandy loam; few, medium, distinct mottles of light gray (10YR 7/1), yellow (10YR 7/8), and yellowish brown (10YR 5/8); weak, medium, subangular blocky structure; very friable; sand grains coated and bridged with clay; strongly acid; gradual, wavy bounlary.

B2t—52 to 65 inches, sandy clay loam; mottled yellow (10YR 7/6), brownish yellow (10YR 6/6), light yellowish brown (10YR 6/4), yellowish brown (10YR 5/8), strong brown (7.5YR 5/6), very pale brown (10YR 7/3), and light gray (10YR 7/1); weak, medium, subangular blocky structure; friable; thin discontinuous clay films on ped faces; very strongly acid.

The A horizon is sand or loamy sand and ranges from 40 to 60 inches in thickness. The A1 or Ap horizon is very dark gray to gray or grayish brown and ranges from 4 to 8 inches in thickness. The A2 horizon is light yellowish brown to pale brown in the upper part and yellowish brown to brownish yellow in the lower part. It has faint to distinct mottles in shades of gray, yellow, or brown. It ranges from 36 to 53 inches in thickness. The Bt horizon is sandy loam or sandy clay loam. The B1t horizon is yellowish brown or brownish yellow to yellow. It has faint to distinct mottles in shades of yellow, brown, gray, and red. The B2t horizon is distinctly to prominently mottled in shades of yellow, brown, gray, and red. Reaction ranges from strongly acid to very strongly acid throughout. The water table is at a depth of 15 to 30 inches for 1 to 2 months in most years.

Albany soils are associated with Ardilla, Chipley, Stilson, and Troup soils. They do not have plinthite that is in the Bt horizon of the Ardilla and Stilson soils. They are not so well

TABLE 1.—*Approximate acreage and proportionate extent of soils*

Soil	Area	Extent	Soil	Area	Extent
	Acres	*Percent*		*Acres*	*Percent*
Albany sand	3, 140	1. 0	Lakeland sand	6, 060	2. 0
Angie fine sandy loam	1, 680	. 5	Leefield loamy sand	770	. 2
Ardilla loamy sand	24, 630	8. 0	Lucy loamy sand, 1 to 8 percent slopes	5, 890	1. 9
Bibb association	32, 370	10. 5	Maxton loamy fine sand	880	. 3
Bonifay sand, 1 to 8 percent slopes	10, 510	3. 4	Orangeburg loamy sand, 2 to 5 percent slopes	5, 590	1. 8
Chipley sand	6, 620	2. 2	Orangeburg loamy sand, 5 to 8 percent slopes	4, 270	1. 4
Dothan loamy sand, 0 to 2 percent slopes	4, 170	1. 3	Pansey loamy sand	6, 850	2. 2
Dothan loamy sand, 2 to 5 percent slopes	56, 000	18. 1	Pantego complex	23, 150	7. 5
Dothan loamy sand, 5 to 8 percent slopes	12, 270	4. 0	Plummer fine sand	1, 650	. 5
Dothan complex	6, 500	2. 1	Stilson loamy sand, 1 to 3 percent slopes	20, 620	6. 7
Faceville sandy loam, 2 to 5 percent slopes	3, 070	1. 0	Tifton loamy sand, 2 to 5 percent slopes	1, 800	. 6
Faceville sandy loam, 5 to 8 percent slopes	1, 460	. 5	Tifton loamy sand, 5 to 8 percent slopes	1, 920	. 6
Fuquay loamy sand, 1 to 8 percent slopes	45, 840	14. 8	Troup sand, 1 to 8 percent slopes	12, 740	4. 1
Gritney loamy sand, 2 to 5 percent slopes	3, 110	1. 0			
Gritney loamy sand, 5 to 8 percent slopes	2, 290	. 7	Total [1]	309, 120	100. 0
Kenansville fine sand	3, 270	1. 1			

[1] Includes water areas that are less than 40 acres in size.

drained as Chipley and Troup soils, and they have a Bt horizon, but the Chipley soils do not.

Albany sand (Ab).—This is a somewhat poorly drained soil on low upland ridges. It has slopes of 2 to 5 percent. The water table is at a depth of 15 to 30 inches for 1 to 2 months in most years.

Included with this soil in mapping are a few small areas of Ardilla loamy sand, Chipley sand, Leefield loamy sand, Pansey loamy sand, and Stilson loamy sand. Also included are some areas of Albany sand that have slopes of less than 2 percent and some areas of Albany soils that have a surface layer of loamy sand.

Among the crops to which this soil is moderately suited are corn, soybeans, and watermelons. The sandy surface layer and subsurface layer are droughty, and crops are affected by lack of water during long dry periods. Among the pasture and hay crops to which the soil is suited are Coastal bermudagrass, bahiagrass, and small grain.

Liming and regular fertilizing are needed for all crops. Erosion is the main hazard in cultivated fields. Cultivated crops should be planted on the contour and in rotation with close-growing, soil-improving crops.

Most of this soil is in native pine forest that has an understory of native grasses and shrubs (fig. 2). Capability unit IIIe-4; woodland suitability group 3w2.

Angie Series

The Angie series consists of moderately well drained, gently sloping soils that formed in loamy marine deposits. These soils are on low ridges between narrow drainageways and depressions.

In a representative profile the surface layer is grayish-brown fine sandy loam about 6 inches thick. The subsoil extends to a depth of 75 inches. In sequence from the top, it is 20 inches of yellowish-brown clay loam; 14 inches of brownish-yellow clay loam that has common, distinct, yellowish-red, red, yellowish-brown, and light-gray mottles; 29 inches of highly mottled clay loam; and 6 inches of highly mottled loam.

The available water capacity is moderate in the surface layer and high in the subsoil. Permeability is moderate to a depth of about 6 inches and slow below this depth. Natural fertility is low.

Representative profile of Angie fine sandy loam, approximately 1.5 miles northwest of Westville and 0.25 mile south of State Highway No. 181 in the NW¼SE¼ sec. 6, T. 4 N., R. 16 W.:

Ap—0 to 6 inches, grayish-brown (10YR 5/2) fine sandy loam; weak, medium, granular structure; very friable; many fine roots; strongly acid; abrupt, smooth boundary.

B1—6 to 9 inches, yellowish-brown (10YR 5/6) clay loam; moderate, medium, subangular blocky structure; friable; common fine roots; thin patchy clay films on ped faces; few dark stains along root channels; strongly acid; gradual, smooth boundary.

B21t—9 to 12 inches, yellowish-brown (10YR 5/8) clay loam; moderate, medium, subangular blocky structure; friable; common fine roots; clay films along ped faces; strongly acid; gradual, smooth boundary.

B22t—12 to 26 inches, yellowish-brown (10YR 5/8) clay loam; few, fine, faint mottles of brownish yellow and yellowish red; moderate, medium, angular blocky structure; firm; few fine roots; clay films on ped faces; strongly acid; gradual, smooth boundary.

Figure 2.—**Slash pine, about 15 years old, planted on Albany sand.**

B23t—26 to 40 inches, brownish-yellow (10YR 6/6) clay loam; common, medium, distinct mottles of yellowish red (5YR 4/8), red (2.5YR 4/6), yellowish brown (10YR 5/8), light yellowish brown (10YR 6/4), and light gray (10YR 7/2); moderate, medium, angular blocky structure; firm; clay films on ped faces; strongly acid; gradual, wavy boundary.

B24t—40 to 69 inches, clay loam; mottled brownish yellow (10YR 6/6), very pale brown (10YR 7/3), light gray (10YR 7/2), strong brown (7.5YR 5/6), pink (7.5YR 7/4), light reddish brown (2.5YR 6/4), yellowish red (5YR 4/6), and red (10R 4/6); moderate, medium, angular blocky structure; firm; clay films on ped faces; strongly acid; clear, wavy boundary.

B3—69 to 75 inches, loam; mottled light gray (10YR 7/1), very pale brown (10YR 7/4), brownish yellow (10YR 6/8), yellowish brown (10YR 5/8), yellowish red (5YR 5/8), and red (10R 4/8); weak, fine, subangular blocky structure; friable; strongly acid.

The A1 or Ap horizon is dark gray, dark grayish brown, or grayish brown and ranges from 4 to 8 inches in thickness. Some profiles have an A2 horizon that is brown or pale brown and ranges from 3 to 7 inches in thickness. The B1 horizon is yellowish brown, light yellowish brown, or light olive brown and ranges from 2 to 6 inches in thickness. The B21t horizon is yellowish brown, brownish yellow, or strong brown and has brownish-yellow and yellowish-red mottles. The B22t horizon is brownish yellow or yellowish brown and has mottles in shades of red, brown, and gray. The B23t and B3 horizons are distinctly to prominently mottled in shades of brown, yellow, gray, and red. Reaction is strongly acid or very strongly acid throughout. The water table is at a depth of 30 to 60 inches for 2 to 6 months in most years.

Angie soils are associated with Ardilla, Pansey, and Stilson soils. They have more clay in the Bt horizons than Ardilla, Pansey, and Stilson soils.

Angie fine sandy loam (An).—This soil is on low ridges between narrow drainageways and depressions. It has slopes of 2 to 5 percent and is moderately well drained. The water table is at a depth of 30 to 60 inches for 2 to 6 months in most years.

Included with this soil in mapping are a few small areas of Ardilla loamy sand, Stilson loamy sand, Fuquay loamy sand, and Dothan loamy sand, 2 to 5 percent slopes. Also included are a few small areas of Pansey loamy sand that are indicated on the detailed soil map by a wet-spot symbol.

Among the cultivated crops to which this soil is moderately suited are corn, soybeans, and watermelons. Among

the pasture and hay crops to which it is suited are Coastal bermudagrass, bahiagrass, and small grain.

Liming and regular fertilizing are needed. Erosion and moderate wetness are the major limitations. Erosion can be controlled by using contour cultivation, terraces, and waterways and by including close-growing crops in the rotation. Turning under crop residue helps to maintain the organic-matter content.

Most of this soil is in native vegetation consisting of pine forest and scattered hardwoods. Capability unit IIIe-3; woodland suitability group 2w8.

Ardilla Series

The Ardilla series consists of nearly level, somewhat poorly drained soils that formed in thick beds of loamy marine deposits. These soils are along narrow drainageways, around depressions, and on low ridges between small streams.

In a representative profile the surface layer is very dark gray loamy sand about 5 inches thick. The subsurface layer is grayish-brown loamy sand 4 inches thick. The subsoil extends to a depth of 65 inches. In sequence from the top, it is 7 inches of light yellowish-brown sandy loam; 20 inches of yellowish-brown sandy clay loam that has light brownish-gray, strong-brown, and yellowish-red mottles; 12 inches of mottled yellowish-brown, light brownish-gray, light-gray, strong-brown, yellowish-red, and red sandy clay loam; and 17 inches of prominently mottled sandy clay loam.

The available water capacity is low in the upper 9 inches, moderate between depths of 9 and 36 inches, and low at a depth below 36 inches. Permeability is moderately rapid to a depth of about 16 inches, moderate between depths of 16 and 36 inches, and moderately slow at a depth below 36 inches. Natural fertility is low.

Representative profile of Ardilla loamy sand, approximately 3 miles east of Bonifay, 1 mile north of U.S. Highway No. 90, and 100 feet west of a good motor road in the NE¼SE¼ sec. 33, T. 5 N., R. 14 W.:

A1—0 to 5 inches, very dark gray (10YR 3/1) loamy sand; weak, medium, granular structure; very friable; many fine and medium roots; few small ironstone concretions; few clean sand grains; strongly acid; clear, smooth boundary.

A2—5 to 9 inches, grayish-brown (10YR 5/2) loamy sand; few tongues of very dark gray material extending down in root channels and pores; weak, medium, granular structure; very friable; common medium and fine roots; few small ironstone concretions; strongly acid; clear, smooth boundary.

B1t—9 to 16 inches, light yellowish-brown (2.5Y 6/4) sandy loam; weak, medium, subangular blocky structure; friable; common fine roots; few small ironstone concretions; sand grains coated and bridged with clay; strongly acid; gradual, smooth boundary.

B21t—16 to 36 inches, yellowish-brown (10YR 5/6) sandy clay loam; few, fine, distinct, light brownish-gray, strong-brown, and yellowish-red mottles; weak, medium, subangular blocky structure; friable; common fine roots; few, thin, discontinuous clay films on ped faces; strongly acid; gradual, wavy boundary.

B22t—36 to 48 inches, sandy clay loam; mottled yellowish brown (10YR 5/6), light brownish gray (2.5Y 6/2), light gray (N 7/0), strong brown (7.5YR 5/8), yellowish red (5YR 5/8), and red (2.5YR 4/8); moderate, medium, subangular blocky structure; friable, except about 45 percent of the volume is firm and brittle; few fine roots; few, thin, discontinuous clay films on ped faces; estimated 8 percent, by volume, is firm, brittle plinthite; strongly acid; gradual, wavy boundary.

B23t—48 to 65 inches, sandy clay loam; prominently mottled yellowish brown (10YR 5/6), brownish yellow (10YR 6/6), pale brown (10YR 6/3), light gray (N 7/0), strong brown (7.5YR 5/8), yellowish red (5YR 5/8), and red (2.5YR 4/8); weak, medium, subangular blocky structure; about 50 percent, by volume, is friable and about 50 percent, by volume, is firm and brittle; few, thin, discontinuous clay films on ped faces; estimated 10 percent, by volume, is firm, brittle plinthite; strongly acid.

The Ap or A1 horizon is dark gray, very dark gray, very dark grayish brown, or black. It ranges from 3 to 6 inches in thickness. The A2 horizon is light brownish gray, grayish brown, or gray and ranges from 4 to 7 inches in thickness. The B1t horizon is light yellowish brown, yellowish brown, or brownish yellow and is 2 to 8 inches thick. The B21t horizon is yellowish brown, brownish yellow, or light yellowish brown and has few faint to distinct mottles of light brownish gray, strong brown, or yellowish red. It ranges from 10 to 25 inches in thickness. The B22t and B23t horizons range from sandy clay loam to sandy clay. They are distinctly to prominently mottled in shades of yellow, brown, gray, and red. They are 5 to 20 percent, by volume, firm, brittle plinthite that is at depths of 20 to 50 inches. About 40 to 60 percent of the B22t and B23t horizons, by volume, are firm and brittle. Reaction is strongly acid to very strongly acid throughout. The water table is at a depth of 15 to 20 inches for 2 to 6 months in most years.

Ardilla soils are associated with Dothan, Fuquay, and Stilson soils. They are more poorly drained than those soils. The A2 horizon of Ardilla soils is not so thick as that of Fuquay and Stilson soils.

Ardilla loamy sand (Ar).—This is a nearly level, somewhat poorly drained soil along narrow drainageways, around depressions, and on low ridges between small streams. The water table is at a depth of 15 to 20 inches for 2 to 6 months in most years.

Included with this soil in mapping are a few small areas of Pansey loamy sand, which are generally indicated on the detailed soil map by a wet-spot symbol, and soils that have less than 5 percent plinthite in the lower part of the subsoil. Also included are small areas of Dothan loamy sand, 2 to 5 percent slopes, Stilson loamy sand, Leefield loamy sand, and a few small areas of Ardilla soils that have slopes of 2 to 5 percent.

Among the cultivated crops to which this soil is suited are corn, soybeans, and watermelons. If it is used for these crops, however, the soil needs some water control practices. Among the pasture and hay crops to which it is well suited are Coastal bermudagrass, bahiagrass, and small grain.

Simple drainage practices are generally adequate to remove excess water in cultivated fields. This soil can be cultivated continuously without hazard of erosion. However, it can be made more productive by using a cropping sequence that includes close-growing and soil-building crops at regular intervals. All crop residue should be returned to the soil. Regular applications of lime and fertilizer are needed. Simple drainage, liming, and fertilizing are needed for pastures.

Most of this soil is in pine forest that has an understory of gallberries and wiregrass. Capability unit IIw-3; woodland suitability group 2w2.

Bibb Series

The Bibb series consists of nearly level, poorly drained soils that formed in loamy fluvial deposits. These soils are

in old stream channels, sloughs, and depressions on flood plains along streams.

In a representative profile the surface layer is sandy loam that is very dark gray in the upper part and grades to dark gray in the lower part. It is about 10 inches thick. The underlying material extends to a depth of 60 inches. The upper 24 inches of this material is gray sandy loam that has few yellowish-brown and light brownish-gray mottles. The lower 16 inches is gray sandy loam that has few light-gray mottles.

The available water capacity is high in the surface layer and moderate in the underlying material. Permeability is moderate throughout. Natural fertility is moderate. These soils are frequently flooded for a short duration and are subject to scouring and uneven deposition of overwash. A few areas that have poor drainage outlets are frequently ponded.

Representative profile of Bibb sandy loam in an area of the Bibb association, approximately 4 miles east of Bonifay, 200 feet north of old Chipley Road, and 75 feet west of Holmes Creek in the NE¼NE¼ sec. 35, T. 5 N., R. 14 W.:

A11—0 to 6 inches, very dark gray (10YR 3/1) sandy loam; weak, fine, granular structure; friable; many medium and fine roots; very strongly acid; gradual, smooth boundary.

A12—6 to 10 inches, dark-gray (10YR 4/1) sandy loam; common, medium, faint mottles of dark grayish brown (10YR 4/2); weak, fine, granular structure; friable; many medium and fine roots; very strongly acid; clear, wavy boundary.

C1g—10 to 34 inches, gray (10YR 5/1) sandy loam; few, fine, distinct mottles of yellowish brown and light brown-gray and few dark stains along root channels; weak, fine, granular structure; nonsticky; common thin strata of loamy sand and sandy loam; few medium and fine roots; very strongly acid; gradual, wavy boundary.

C2g—34 to 60 inches, gray (10YR 6/1) sandy loam; few, fine, faint mottles of light gray and few dark stains in old root channels; weak, fine, granular structure; nonsticky; common thin strata of loamy sand and sandy loam; few fine roots; very strongly acid.

The A1 horizon is very dark grayish-brown, brown, very dark gray, gray, or dark-gray sandy loam or loam. It ranges from 6 to 15 inches in thickness. The C horizon is light-gray or gray loam or sandy loam that has few to many mottles in shades of gray, brown, and yellow. It is stratified with lenses of sand in many places. The content of small quartz pebbles ranges from 0 to 5 percent, by volume, throughout. These soils are strongly acid to very strongly acid throughout. The water table is at a depth of 0 to 15 inches 6 to 12 months each year.

Bibb soils are associated with Kenansville, Maxton, Pansey, and Plummer soils. They are more poorly drained than Maxton and Kenansville soils, they do not have the Bt horizon that Pansey soils have, and they do not have the extremely thick, sandy A horizon that Plummer soils have.

Bibb association (Bb).—This association of nearly level soils occurs on flood plains of streams that are subject to 7- to 30-day periods of stream overflow. The water table is at a depth of less than 15 inches for 6 to 12 months each year. Some areas are covered with shallow water for 3 to 9 months in most years.

The composition of this mapping unit is more variable and the areas are generally much larger than those of most other units in the county. Mapping has been controlled well enough, however, for the anticipated uses of the soils.

Poorly drained Bibb soils make up about 40 percent of the association. About 25 percent is better drained soils that are in positions slightly above those of the Bibb soils. These better drained soils have a sandy clay loam subsoil that has thin lenses of coarser textured soil material. The remaining 35 percent is made up of several minor soils. Among these are very poorly drained and poorly drained soils that are sandy to a depth of more than 60 inches; very poorly drained soils that have a subsoil of stratified sand, sandy loam, and sandy clay loam; and soils in sloughs that have a fine-textured subsoil and are covered with shallow water most of the time. Small areas of Pansey and Plummer soils occur near the borders of some areas. None of these minor soils make up more than 10 percent of any area mapped as the association.

This association occurs in areas where detailed investigation is limited by wetness and dense vegetation, and precise identification of the soils is not feasible, because the potential for intensive use is low. The soils are not suited to any cultivated crops, because of excessive wetness and the hazard of flooding by stream overflow. Drainage is not feasible. The soils are poorly suited to pasture grasses and hay crops. Pasture grasses could be established and improved; however, all the areas of the association have a rather dense cover of gum, bay, cypress, elm, and longleaf pine. Improved pasture would be subject to damage from stream overflow. Land clearing and site preparation for improved pasture might not be feasible, because of the difficulty and the cost. Capability unit Vw-1; woodland suitability group 2w9.

Bonifay Series

The Bonifay series consists of nearly level to sloping, well-drained soils that formed in thick beds of sandy and loamy marine deposits. These soils are on narrow tops and long sides of ridges.

In a representative profile the surface layer is dark grayish-brown sand about 6 inches thick. The subsurface layer is sand, about 51 inches thick, that is yellowish brown in the upper 30 inches and grades to pale brown in the lower part. This layer has common very pale brown and brownish-yellow mottles. The subsoil extends to a depth of 73 inches. The upper 6 inches of the subsoil is light yellowish-brown sandy loam that has few yellowish-brown, yellowish-red, and strong-brown mottles. The lower part is light yellowish-brown sandy clay loam that has common yellowish-brown, strong-brown, yellowish-red, and red mottles.

The available water capacity is low to a depth of about 57 inches and moderate below this depth. Permeability is rapid to a depth of 57 inches and moderate below this depth. Natural fertility is low.

Representative profile of Bonifay sand, 1 to 8 percent slopes, approximately 2 miles north of U.S. Highway No. 90, 100 yards east of the intersection of State Road No. 81A and a good motor road, about 75 feet south of the good motor road in the SE¼SW¼ sec. 7, T. 4 N., R. 17 W.:

A1—0 to 6 inches, dark grayish-brown (10YR 4/2) sand; single grained; loose; many fine roots; very few small ironstone concretions 2 to 5 millimeters in size; strongly acid; gradual, wavy boundary.

A21—6 to 36 inches, yellowish-brown (10YR 5/4) sand; common, medium, faint mottles of very pale brown (10YR 7/3); single grained; loose; many fine roots; very few

ironstone concretions 2 to 5 millimeters in size; sand grains dominantly coated with oxides; strongly acid; gradual, wavy boundary.

A22—36 to 57 inches, pale-brown (10YR 6/3) sand; common, medium, distinct mottles of very pale brown (10YR 7/3), yellowish brown (10YR 5/4), and brownish yellow (10YR 6/6); single grained; loose; sand grains dominantly clean; few fine roots; strongly acid; gradual, wavy boundary.

B1t—57 to 63 inches, light yellowish-brown (10YR 6/4) sandy loam; few, medium, distinct mottles of yellowish brown (10YR 5/6), yellowish red (5YR 5/6), and strong brown (7.5YR 5/6); weak, medium, subangular blocky structure; friable; sand grains coated and bridged with clay; estimated 8 percent is firm, brittle plinthite; strongly acid; gradual, wavy boundary.

B2t—63 to 73 inches, light yellowish-brown (10YR 6/4) sandy clay loam; common, medium, distinct mottles of yellowish brown (10YR 5/6), strong brown (7.5YR 5/6), yellowish red (5YR 5/6), and red (2.5YR 4/8); weak, medium, subangular blocky structure; firm; thin discontinuous clay films on ped faces; estimated 15 percent is firm, brittle plinthite; strongly acid.

The A1 or Ap horizon is dark grayish-brown, brown, grayish-brown, gray, or light brownish-gray sand or loamy sand. It ranges from 3 to 8 inches in thickness. The A2 horizon is brownish-yellow, yellowish-brown, pale-brown, or light yellowish-brown sand or loamy sand. It ranges from 37 to 52 inches in thickness. It has few to common mottles of very pale brown, yellowish brown, and brownish yellow.

The B1t horizon is yellowish-brown, brownish-yellow, or light yellowish-brown sandy loam or sandy clay loam. It ranges from 4 to 16 inches in thickness. It has few to common mottles in shades of red, yellow, and brown in some places. The B2t horizon is the same basic color as the B1t horizon but has common to many mottles. It is sandy loam or sandy clay loam. It is 15 to 25 percent clay and less than 20 percent silt. The B2t and B1t horizons have 5 to 20 percent firm, brittle plinthite. Reaction is strongly acid or very strongly acid throughout. The content of ironstone concretions, 2 to 5 millimeters in size, ranges from 0 to 5 percent by volume throughout the profile. The water table is at a depth of more than 73 inches.

Bonifay soils are associated with Albany, Fuquay, and Stilson soils. They are better drained than Albany and Stilson soils, they have plinthite in the B2t horizon that Albany soils do not, and they have a thicker A2 horizon than Fuquay and Stilson soils.

Bonifay sand, 1 to 8 percent slopes (BoC).—This is a nearly level to sloping, well-drained soil on narrow tops and long sides of ridges. The water table is at a depth of more than 73 inches.

Included with this soil in mapping are a few small areas of Troup sand, Lakeland sand, and Fuquay loamy sand. Also included are a few small areas of Albany sand and Ardilla loamy sand, most of which are indicated on the detailed soil map by wet-spot symbols, and a few areas of Bonifay soils that have a surface layer of loamy sand.

Among the cultivated crops to which this soil is moderately suited are corn, peanuts, and soybeans. Among the pasture and hay crops to which it is suited are bahiagrass, Coastal bermudagrass, and small grain.

Liming and regular fertilizing are needed. Droughtiness and rapid leaching are severe limitations if the soil is used for crops. Special conservation practices are required that improve the available water capacity in the major root zone. A cropping sequence that includes crops producing large amounts of residue that can be returned to the soil is such a practice; and clean-tilled crops in rotation with cover crops, small grain, or perennial grasses is a good example. The hazard of erosion is slight to moderate on side slopes. Erosion can be controlled by contour cultivation and by alternate strips of perennial grass or small grain. Terracing is not practical.

Most of this soil is in pine forest. Capability unit IIIs-1; woodland suitability group 3s2.

Chipley Series

The Chipley series consists of nearly level to gently sloping, moderately well drained soils that formed in thick beds of sandy marine deposits. These soils are on low ridges around small streams.

In a representative profile the surface layer is a dark-gray to grayish-brown sand about 7 inches thick. The underlying material extends to a depth of 90 inches. In sequence from the top, it is 23 inches of light yellowish-brown sand; 12 inches of light yellowish-brown sand that has light-gray, very pale brown, and strong-brown mottles; and 48 inches of mottled light yellowish-brown, light-gray, brown, and red sand.

The available water capacity is low throughout. Permeability is rapid throughout. Natural fertility is low.

Representative profile of Chipley sand, approximately 0.5 mile north of Ponce de Leon and 150 feet west of a good motor road in the NE¼SE¼ sec. 21, T. 4 N., R. 17 W.:

A11—0 to 4 inches, dark-gray (10YR 4/1) sand; single grained; loose; many fine roots; strongly acid; clear, smooth boundary.

A12—4 to 7 inches, grayish-brown (10YR 5/2) sand; few thin tongues of dark materials extending down in root channels; single grained; loose; common fine roots; strongly acid; gradual, wavy boundary.

C1—7 to 16 inches, light yellowish-brown (10YR 6/4) sand; single grained; loose; common fine roots and few medium roots; sand grains dominantly coated with oxides; strongly acid; gradual, smooth boundary.

C2—16 to 30 inches, light yellowish-brown (10YR 6/4) sand; few, fine, faint mottles of light gray and brown; single grained; loose; few fine roots; sand grains in the light-gray mottles are dominantly clean; matrix sand grains are dominantly coated; strongly acid; gradual, smooth boundary.

C3—30 to 42 inches, light yellowish-brown (10YR 6/4) sand; common, medium, faint mottles of light gray (10YR 7/1) and very pale brown (10YR 7/3), few, fine, distinct mottles of strong brown (7.5YR 5/6); single grained; loose; few fine roots; sand grains dominantly coated; strongly acid; gradual, smooth boundary.

C4—42 to 90 inches, sand; mottled light yellowish brown (10YR 6/4), light gray (10YR 7/1), brown (10YR 5/3), and red (2.5YR 5/6); single grained; loose; few fine roots; strongly acid.

The A1 or Ap horizon is gray, dark gray, dark grayish brown, grayish brown, or very dark gray. It ranges from 6 to 10 inches in thickness. The C horizon is yellowish brown, brownish yellow, yellow, light yellowish brown, very pale brown, or pale brown. Patches of white or light-gray, clean sand grains occur as faint to distinct mottles at a depth of 24 inches or more. The C4 horizon is mottled in shades of brown, yellow, gray, and red. Reaction is strongly acid to very strongly acid throughout. The silt and clay content, between depths of 10 and 40 inches, is 5 to 10 percent. The water table is generally at a depth of 40 to 60 inches, but during wet seasons it rises to a depth of 20 to 40 inches for 2 to 6 months in most years.

Chipley soils are associated with Albany, Lakeland, Stilson, and Troup soils. They lack a Bt horizon that Albany, Stilson, and Troup soils have. They are not so well drained as Lakeland soils, and they are better drained than Albany soils.

Chipley sand (Ch).—This is a moderately well drained soil on low ridges adjacent to small streams. It has slopes of 0 to 5 percent. The water table is generally at a depth of 40 to 60 inches, but it rises to a depth of 20 to 40 inches for 2 to 6 months in most years.

Included with this soil in mapping are a few small areas of Albany sand, Stilson loamy sand, Lakeland sand, and Troup sand. Also included are a few small areas of Pansey loamy sand and Ardilla loamy sand that are indicated on the soil map by wet-spot symbols, and a few areas of a Chipley sand that has slopes of 5 to 8 percent.

Among the cultivated crops to which this soil is moderately suited are corn, soybeans, and watermelons. Among the pasture and hay crops to which it is suited are bahiagrass, Coastal bermudagrass, and small grain.

In wet seasons the water table rises into the root zone of most cultivated crops and is a minor hazard to the use of this soil for cultivated crops. Simple drainage to remove excess surface water is needed. This soil is deep and sandy, and as a result the principal limitations are very low available water capacity and rapid leaching. Available water capacity can be improved by using a cropping sequence that includes close-growing and soil-building crops at regular intervals. All crop residue should be returned to the soil. All crops require lime and liberal use of fertilizer.

Much of the soil is in pine forest. Capability unit IIIs-2; woodland suitability group 2w2.

Dothan Series

The Dothan series consists of nearly level to strongly sloping, well-drained soils that formed in loamy marine deposits. These soils are on broad ridges and long side slopes between small streams and drainageways.

In a representative profile the surface layer is dark grayish-brown loamy sand about 8 inches thick. The subsoil extends to a depth of 67 inches. In sequence from the top, it is 5 inches of yellowish-brown sandy loam; 27 inches of yellowish-brown sandy clay loam that has strong-brown and yellowish-red mottles in the lower part; 12 inches of brownish-yellow sandy clay loam that has strong-brown, yellowish-red, yellowish-brown, and red mottles; and 15 inches of mottled yellowish-brown, brownish-yellow, gray, very pale brown, strong-brown, and red sandy clay loam.

Available water capacity is low in the surface layer and moderate in the subsoil. Permeability is moderately rapid to a depth of about 8 inches, moderate between depths of 8 and 30 inches, and moderately slow at a depth below 30 inches. Natural fertility and the organic-matter content are low.

Representative profile of Dothan loamy sand, 2 to 5 percent slopes, approximately 7 miles north of the city limits of Bonifay, about 100 yards east of U.S. Highway No. 79, in the NW¼NE¼ sec. 32, T. 6 N., R. 14 W.:

Ap—0 to 8 inches, dark grayish-brown (10YR 4/2) loamy sand; weak, medium, granular structure; very friable; many fine and medium roots; strongly acid; clear, wavy boundary.

B1—8 to 13 inches, yellowish-brown (10YR 5/6) sandy loam; weak, medium, subangular blocky structure; very friable; common fine roots; few small iron and quartz pebbles; sand grains coated and bridged with clay; strongly acid; gradual, wavy boundary.

B21t—13 to 30 inches, yellowish-brown (10YR 5/8) sandy clay loam; moderate, medium, subangular blocky structure; friable; few fine roots; thin discontinuous clay films on ped faces; strongly acid; gradual, wavy boundary.

B22t—30 to 40 inches, yellowish-brown (10YR 5/8) sandy clay loam; common, medium, distinct, strong-brown (7.5YR 5/6) and few, fine, distinct, yellowish-red mottles; moderate, medium, subangular blocky structure; friable; few fine roots; thin discontinuous clay films on ped faces; estimated 3 percent is firm plinthite; strongly acid; gradual, wavy boundary.

B23t—40 to 52 inches, brownish-yellow (10YR 6/6) sandy clay loam; common, medium, prominent mottles of strong brown (7.5YR 5/8), yellowish red (5YR 5/8), yellowish brown (10YR 5/6), and red (2.5YR 4/6); moderate, medium, subangular blocky structure; friable; thin discontinuous clay films on ped faces; estimated 10 percent is firm, brittle plinthite; strongly acid; gradual, wavy boundary.

B24t—52 to 61 inches, sandy clay loam; mottled yellowish brown (10YR 5/8), brownish yellow (10YR 6/6), gray (10YR 6/1), very pale brown (10YR 7/3), strong brown (7.5YR 5/8), and red (2.5YR 4/6); strong, medium, subangular blocky structure; friable; discontinuous clay films on ped faces; estimated 18 percent is firm, brittle plinthite; strongly acid.

B3t—61 to 67 inches, sandy clay loam; mottled brownish yellow (10YR 6/6), light gray (10YR 7/1), strong brown (7.5YR 5/6), weak red (10R 4/3), and red (10R 4/6); coarse, medium, subangular blocky structure; firm; thin discontinuous clay films on ped faces; estimated 5 percent is firm, brittle plinthite; strongly acid.

The Ap or A1 horizon is very dark grayish-brown, dark grayish-brown, grayish-brown, or brown loamy sand or sandy loam. It ranges from 6 to 10 inches in thickness. Some profiles have an A2 horizon that is brown, yellowish brown, or light yellowish brown and is 3 to 6 inches thick.

The B1 horizon is yellowish-brown, brownish-yellow, light yellowish-brown, or strongly-brown sandy loam, fine sandy loam, or sandy clay loam. It ranges from 3 to 10 inches in thickness. The B2t horizon ranges from 30 to 60 inches in thickness. The B21t, B22t, and B23t horizons are yellowish-brown, brownish-yellow, or strong-brown sandy loam, fine sandy loam, or sandy clay loam. The B22t and B23t horizons have common to many mottles in shades of red, brown, or yellow. The B23t horizon contains 5 to 10 percent plinthite. The B24t horizon is mottled in shades of red, gray, yellow, or brown. It contains 8 to 20 percent, by volume, firm, brittle plinthite. The B24t and B3t horizons range from sandy clay loam to sandy clay. The B3t horizon is mottled and contains about 5 to 10 percent, by volume, firm, brittle plinthite.

Reaction is strongly acid or very strongly acid throughout. The content of strongly cemented ironstone concretions ranges from 0 to 5 percent throughout the profile. Depth to horizons containing more than 5 percent plinthite ranges from 24 to 60 inches but is commonly 35 to 45 inches. The water table is at a depth of more than 72 inches.

Dothan soils are associated with Ardilla, Fuquay, Orangeburg, and Tifton soils. They are better drained than Ardilla soils, and they have a thinner A2 horizon than Fuquay soils. Dothan soils differ from Orangeburg soils in having plinthite in the profile. They have fewer ironstone concretions in the surface layer than Tifton soils.

Dothan loamy sand 0 to 2 percent slopes (DoA).—This is a well-drained soil on broad ridges.

Included with this soil in mapping are a few small areas of Fuquay loamy sand, Ardilla loamy sand, and Orangeburg loamy sand, 2 to 5 percent slopes. Also included are a few areas of Dothan soils that have 2 to 5 percent slopes and soils that are similar to Dothan soils but have less than 5 percent plinthite in the lower part of the subsoil.

Among the cultivated crops to which this soil is suited are peanuts, corn, soybeans, and watermelons, and much of the acreage is used for these crops. Among the pasture and hay crops to which the soil is well suited are Coastal bermudagrass, bahiagrass, and small grain (fig. 3).

Because runoff is slow and the erosion hazard is only slight, this soil can be cultivated year after year without significant losses of soil. Close-growing and soil-building crops should be included in the cropping system regularly to help maintain the organic-matter content and keep the soil in good tilth. All crop residue should be returned to the soil. Regular applications of lime and fertilizer are

Figure 3.—Horses and cattle grazing in a pasture of bahiagrass. The soil is Dothan loamy sand, 0 to 2 percent slopes.

needed. Capability unit IIs–1; woodland suitability group 2o1.

Dothan loamy sand, 2 to 5 percent slopes (DoB).—This is a well-drained soil on long side slopes between small streams and drainageways. The water table is at a depth of more than 72 inches. The profile of this soil is the one described as representative of the series.

Included with this soil in mapping are a few small areas of Fuquay loamy sand, Tifton loamy sand, Ardilla loamy sand, and Orangeburg loamy sand, 2 to 5 percent slopes. Also included are areas of Dothan soil where the surface layer is sandy loam and areas of eroded Dothan soils. In the eroded areas the original surface layer has been mixed with material from the upper part of the subsoil, and the resulting plow layer is sandy loam. Other inclusions are a few small spots where severe sheet erosion has taken place and some areas where a few shallow gullies have been formed.

Among the cultivated crops to which this soil is suited are peanuts, corn, soybeans, and watermelons. The soil is also suited to Coastal bermudagrass, bahiagrass, and small grain.

This soil responds well to lime and fertilizer. Runoff is moderate, and erosion is a hazard (fig. 4). Runoff can be reduced and erosion can be controlled by such measures as contour cultivation, terraces, and stabilized waterways and by including close-growing crops in the rotation every other year. Turning under crop residue helps to maintain the organic-matter content.

Most of this soil has been cultivated, but now much of it is in pasture or has been planted to slash pines. Capability unit IIe–1; woodland suitability group 2o1.

Dothan loamy sand, 5 to 8 percent slopes (DoC).—This is a well-drained soil on side slopes of short to medium length around ridgetops.

Included with this soil in mapping are small areas of Gritney loamy sand, 5 to 8 percent slopes, Fuquay loamy sand, Faceville sandy loam, 5 to 8 percent slopes, and Orangeburg loamy sand, 5 to 8 percent slopes. Also included are a few areas of eroded soils that have spots where severe sheet erosion has taken place and shallow gullies have been formed. Other inclusions are small areas of Dothan loamy sand, 2 to 5 percent slopes, and areas of Dothan soils that have a surface layer of sandy loam.

Among the cultivated crops to which this soil is moderately suited are peanuts, corn, soybeans, and watermelons. The soil is also suited to Coastal bermudagrass, bahiagrass, and small grain.

Runoff is moderate to rapid, and the major limitation is the hazard of erosion. Erosion can be controlled by terraces, protected waterways, crop rotation, and contour cultivation. Waterways should be constructed and stabilized before terraces are constructed. A cropping system that includes close-growing crops in rotation with cultivated crops is desirable. Strips of perennial grass, established at regular intervals across the slope, make such a cropping system more effective. All crop residue should be returned to the soil.

Much of this soil has been cultivated, but now the old fields are in pasture or are planted to pines. Areas not previously used for cultivation are in native pine forest. Capability unit IIIe–1; woodland suitability group 2o1.

Dothan complex (Dt).—This complex consists of well-drained soils that have slopes of 8 to 12 percent. It is about

Figure 4.—**A field that is eroded because it has been plowed up and down the slope and across the terraces. The soil is Dothan loamy sand, 2 to 5 percent slopes.**

45 percent Dothan soils, 25 percent Troup soils, 15 percent Lucy soils, and 8 percent Fuquay soils. The remaining 7 percent is mainly Bonifay, Lakeland, Orangeburg, and Stilson soils. These soils occur in such intricate patterns that it is not practical to map them separately. The proportion and composition of the soils in each mapped area are variable.

Dothan soils occur mainly near the tops of slopes, but Troup soils and the other soils occur on the middle or lower slopes. The Dothan soils in this complex are similar to Dothan loamy sand, 2 to 5 percent slopes, but they are more sloping and have an eroded surface layer. The Troup, Lucy, and Fuquay soils in this complex are similar to the representative soil in their series, but they are more sloping.

Most areas of this complex are in woodland consisting of slash pines and longleaf pines, scattered turkey oaks, post oaks, and red oaks, and a few dogwoods. This complex is generally not suited to cultivated crops and is not used for them, mainly because the hazard of erosion is high. A few areas have been cleared and used for pasture grasses or have been reforested to slash pines. The complex is poorly suited to pasture and hay because the hazard of erosion is high until the grasses are established and form a protective cover. Overgrazing should be avoided on pastures, and regular applications of fertilizer and lime are needed. Capability unit VIe–1; woodland suitability group 3s2.

Faceville Series

The Faceville series consists of gently sloping to sloping, well-drained soils that formed in clayey marine deposits. These soils are on the tops and sides of ridges.

In a representative profile the surface layer is dark-brown sandy loam about 6 inches thick. The subsoil extends to a depth of 65 inches and is mainly red sandy clay to a depth of about 61 inches. Below a depth of 21 inches, the subsoil has few to common yellowish-red, yellowish-brown, and strong-brown mottles.

The available water capacity is moderate throughout. Permeability is moderately rapid to a depth of about 6 inches and moderate below this depth. Natural fertility is low.

Representative profile of Faceville sandy loam, 2 to 5 percent slopes, approximately 1 mile west of State Highway No. 79 on the north side of a good motor road in the NW¼NE¼ sec. 31, T. 6 N., R. 14 W.:

Ap—0 to 6 inches, dark-brown (7.5YR 4/4) sandy loam; moderate, medium, granular structure; friable; many small and medium roots; estimated 25 percent of Ap horizon is mixed with material from B1t horizon; few, strongly cemented ironstone concretions; strongly acid; clear, smooth boundary.

B1t—6 to 9 inches, red (2.5YR 4/8) sandy clay loam; moderate, medium, subangular blocky structure; friable; few fine roots; thin discontinuous clay films between ped faces; very few, strongly cemented ironstone concretions; strongly acid; gradual, wavy boundary.

B21t—9 to 21 inches, red (2.5YR 4/6) sandy clay; moderate, medium, angular blocky structure; firm; few fine roots; clay films on ped faces; very few, strongly cemented ironstone concretions; strongly acid; gradual, smooth boundary.

B22t—21 to 43 inches, red (2.5YR 4/6) sandy clay; few, fine, distinct, yellowish-red, red, and yellowish-brown mottles; moderate, medium, angular blocky structure; firm; few fine roots; clay films between ped faces; very few, small, strongly cemented ironstone concretions, about one-half inch in diameter; strongly acid; gradual, wavy boundary.

B23t—43 to 61 inches, red (2.5YR 4/6) sandy clay; few, fine, distinct, red mottles and common, medium, distinct, strong-brown (7.5YR 5/8) mottles; moderate, medium, angular blocky structure; firm; very few, small, strongly cemented ironstone concretions approximately one-half inch in diameter; clay films between ped faces; strongly acid; gradual, wavy boundary.

B3t—61 to 65 inches, sandy clay; mottled red (2.5YR 4/6 and 10YR 4/8), strong brown (7.5YR 4/8), yellowish brown (10YR 5/8) and pale brown (10YR 6/3); moderate, medium, angular blocky structure; firm; clay films between ped faces; strongly acid.

The A1 or Ap horizon is dark gray, dark grayish brown, or dark brown and ranges from 4 to 10 inches in thickness. The B1t horizon is strong brown, yellowish red, or red and ranges from 3 to 9 inches in thickness. A few cultivated areas do not have a B1 horizon, and in these areas the Ap horizon overlies the B2t horizon. The B21t, B22t, and B23t horizons are yellowish-red or red sandy clay or clay. The B22t and B23t horizons have few to common mottles in shades of red, brown, and yellow. The B3t horizon is mottled in shades of brown, red, or yellow and is sandy clay or clay. The content of clay in the Bt horizon is 35 to 60 percent, and the content of silt and very fine sand is less than 30 percent. Reaction is strongly or very strongly acid throughout. The content of strongly cemented ironstone concretions ranges from 0 to 5 percent by volume throughout. The water table is at a depth of more than 72 inches.

The percentage of minerals other than kaolinite in the clay in the subsoil of the Faceville soils as mapped in this survey is greater than that described as representative of the series. Therefore, the plasticity of these soils is greater, but this does not appreciably affect their use and management.

Faceville soils are associated with Ardilla, Dothan, Fuquay, and Orangeburg soils. They are better drained than Ardilla soils. They have a finer textured Bt horizon than Dothan and Orangeburg soils. Faceville soils do not have plinthite in the lower part of the Bt horizon, and the Dothan soils do. Faceville soils have a thinner A horizon than Fuquay soils.

Faceville sandy loam, 2 to 5 percent slopes (FcB).—This is a well-drained soil on ridgetops. The water table is at a depth of more than 72 inches. The profile of this soil is the one described as representative for the series.

Included with this soil in mapping are a few small areas of Dothan loamy sand, 2 to 5 percent slopes, Orangeburg loamy sand, 2 to 5 percent slopes, Lucy loamy sand, and Gritney loamy sand, 2 to 5 percent slopes. Also included are a few small areas of Faceville soils that have slopes of 5 to 8 percent and soils that are similar to Faceville soils, except that they are yellowish brown in the upper part of the subsoil and are mottled, compact sandy clay loam in the lower part of the subsoil.

Among the cultivated crops to which this soil is suited are corn, peanuts, soybeans, and watermelons. Among the pasture and hay crops to which it is well suited are Coastal bermudagrass, bahiagrass, and small grain.

Liming and regular fertilizing are needed. The main limitation to the use of this soil for cultivated crops is the moderate hazard of erosion. Runoff is moderate. All cultivation should be on the contour. Terraces that have stabilized waterways are needed to reduce runoff and control erosion. This soil also can be protected against erosion and be made more productive by including close-growing, soil-improving crops in the rotation and by planting winter cover crops. Turning under all crop residue helps to maintain the organic-matter content and control erosion. Capability unit IIe–2; woodland suitability group 3o1.

Faceville sandy loam, 5 to 8 percent slopes (FcC).—This is a well-drained soil on short side slopes. Included with this soil in mapping are small areas of Gritney loamy sand, 5 to 8 percent slopes, Dothan loamy sand, 5 to 8 percent slopes, and Orangeburg loamy sand, 5 to 8 percent slopes. Also included are a few small areas of Faceville soils that have slopes of 2 to 5 percent and some small, severely eroded spots.

Among the cultivated crops to which this soil is moderately suited are corn, peanuts, soybeans, and watermelons. Among the pasture and hay crops to which it is suited are Coastal bermudagrass, bahiagrass, and small grain.

Runoff is medium to rapid, and the hazard of erosion is severe. For this reason, special conservation practices are required. Contour cultivation, terraces, and stabilized waterways are essential to reduce runoff and erosion if the soil is cultivated. Waterways should be sodded before terraces are constructed. Row crops should be rotated in sequence with close-growing, soil-improving crops and winter cover crops. All crop residue should be turned under to maintain the organic-matter content and help control erosion. Capability unit IIIe–2; woodland suitability group 3o1.

Fuquay Series

The Fuquay series consists of nearly level to sloping, well-drained soils that formed in loamy marine deposits. These soils are on broad ridges and long side slopes.

In a representative profile the surface layer is dark grayish-brown loamy sand about 6 inches thick. The subsurface layer is loamy sand about 27 inches thick. It grades from yellowish brown to brownish yellow as depth increases. The upper 12 inches of the subsoil is brownish-yellow sandy loam. The next 10 inches is brownish-yellow sandy clay loam that has common strong-brown and red mottles. Below this, and reaching to a depth of 88 inches, the subsoil is mottled brownish-yellow, pale-brown, light-gray, olive-yellow, strong-brown, yellowish-red, and red sandy clay loam.

The available water capacity is low to a depth of about 33 inches and moderate below this depth. Permeability is rapid to a depth of about 33 inches, moderately rapid between depths of 33 to 45 inches, and slow below a depth of 45 inches. Natural fertility is low.

Representative profile of Fuquay loamy sand, 1 to 8 percent slopes, approximately 2.0 miles west of Bonifay and 0.25 mile south of U.S. Highway No. 90 in the SE¼SE¼ sec. 34, T. 5 N., R. 15 W.:

Ap—0 to 6 inches, dark grayish-brown (10YR 4/2) loamy sand; weak, medium, granular structure; very friable; many fine roots and few medium roots; few small ironstone concretions; strongly acid; clear, smooth boundary.

A21—6 to 13 inches, yellowish-brown (10YR 5/6) loamy sand; weak, medium, granular structure; very friable; few

fine and medium roots; few dark stains from Ap horizon along root channels; few small ironstone concretions; strongly acid; gradual, smooth boundary.

A22—13 to 33 inches, brownish-yellow (10YR 6/6) loamy sand; few, fine, faint mottles of light gray and few dark stains along root channels; weak, medium, granular structure; very friable; few small ironstone concretions; strongly acid; gradual, wavy boundary.

B1t—33 to 45 inches, brownish-yellow (10YR 6/6) sandy loam; few, fine, distinct mottles of reddish yellow; weak, medium, subangular blocky structure; friable; few fine and medium roots; sand grains coated and bridged with clay; strongly acid; gradual, wavy boundary.

B21t—45 to 57 inches, brownish-yellow (10YR 6/6) sandy clay loam; common, medium, distinct mottles of strong brown (7.5YR 5/6) and red (2.5YR 4/8); moderate, medium, subangular blocky structure; friable; thin discontinuous clay films on ped faces; few small and medium ironstone concretions; estimated 6 percent, by volume, is firm, brittle plinthite; strongly acid; gradual, wavy boundary.

B22t—57 to 88 inches, sandy clay loam; mottled brownish yellow (10YR 6/8), pale brown (10YR 6/3), light gray (10YR 7/1), olive yellow (2.5Y 6/6), strong brown (7.5YR 5/8), yellowish red (5YR 5/8), and red (2.5YR 4/6); moderate, medium, subangular blocky structure; firm; thin discontinuous clay films on ped faces; estimated 10 percent, by volume, is firm, brittle plinthite; strongly acid.

The A horizon ranges from 23 to 40 inches in thickness. The A1 or Ap horizon is grayish brown, dark grayish brown, or dark gray and ranges from 3 to 9 inches in thickness. The A2 horizon is brownish yellow, light yellowish brown, yellow, yellowish brown, or very pale brown and ranges from 20 to 35 inches in thickness. The B1t horizon is brownish-yellow, yellowish-brown, or strong-brown sandy loam or sandy clay loam and ranges from 6 to 12 inches in thickness. The B21t horizon is brownish-yellow, yellowish-brown, or strong-brown sandy loam or sandy clay loam. In most places the B1t and B21t horizons have few to common mottles in shades of red, yellow, and brown. The B22t horizon is sandy clay loam or sandy loam that is mottled in shades of brown, yellow, red, and gray. It is 8 to 15 percent, by volume, firm, brittle plinthite.

Reaction is strongly acid or very strongly acid throughout. Depth to horizons that have more than 5 percent, by volume, plinthite is 35 to 50 inches. The content of strongly cemented ironstone concretions ranges from 0 to 5 percent, by volume, throughout. The water table is at a depth of more than 88 inches.

Fuquay soils are associated with Ardilla, Dothan, Stilson, and Troup soils. They are better drained than Ardilla and Stilson soils. They have a thicker A2 horizon than the Ardilla and Dothan soils, but they have a thinner A2 horizon than the Troup soils.

Fuquay loamy sand, 1 to 8 percent slopes (FuC).—This is a well-drained soil on broad ridges and long side slopes. The water table is at a depth of more than 88 inches.

Included with this soil in mapping are a few small areas of Dothan loamy sand that has slopes of 2 to 8 percent, Stilson loamy sand, Lucy loamy sand, Bonifay sand, and Troup sand. Also included are a few small areas of soils that are similar to Fuquay soils but have less than 5 percent plinthite in the lower part of the subsoil.

Among the cultivated crops to which this soil is suited are peanuts, soybeans, and watermelons. Among the pasture and hay crops to which it is well suited are Coastal bermudagrass, bahiagrass, and small grain (fig. 5).

The lack of moisture in the major root zone during hot summer months sometimes causes crop damage, and droughtiness is the main limitation for crop production. Moderate practices are needed to increase the content of moisture in this soil. Crop residue should be returned to the soil, and annual crops that produce a large amount of residue that can be returned help to improve the organic-

Figure 5.—Cattle grazing in excellent pasture of bahiagrass. The soil is Fuquay loamy sand, 1 to 8 percent slopes.

matter content. A cropping sequence that includes perennial grasses or cover crops is desirable. Only moderate practices are needed to protect the soil on side slopes from erosion. Contour cultivation generally is sufficient, but alternate strips of perennial grass are needed in a few places. Capability unit IIs–2; woodland suitability group 3s2.

Gritney Series

The Gritney series consists of gently sloping to sloping, well-drained soils that formed in thick beds of loamy marine deposits. These soils are on knolls, short choppy slopes, and ridge crests.

In a representative profile the surface layer is dark grayish-brown loamy sand about 7 inches thick. The subsoil extends to a depth of 50 inches. The upper 5 inches of the subsoil is light olive-brown sandy clay loam; the next 19 inches is brownish-yellow sandy clay that has yellowish-red, red, light-gray, and pale-brown mottles; and the lower 19 inches is mottled brownish-yellow, yellowish-red, red, strong-brown, and light-gray sandy clay loam. The underlying material extends to a depth of 68 inches. It is coarsely mottled brownish-yellow, dark-red, weak-red, and pale-brown sandy clay loam.

The available water capacity is low in the surface layer and moderate in all other layers. Permeability is rapid to a depth of 7 inches, moderate between depths of 7 and 12 inches, slow between depths of 12 and 31 inches, and moderately slow below a depth of 31 inches. Natural fertility is low.

Representative profile of Gritney loamy sand, 2 to 5 percent slopes, approximately 2.25 miles east of the city limits of Bonifay on old Chipley Road, about 100 feet south of the road in the NE¼NE¼ sec. 34, T. 5 N., R. 14 W.:

Ap—0 to 7 inches, dark grayish-brown (2.5Y 4/2) loamy sand; weak, medium, granular structure; friable; many fine and medium roots; strongly acid; clear, wavy boundary.

B1t—7 to 12 inches, light olive-brown (2.5Y 5/6) sandy clay loam; weak, medium, subangular blocky structure; friable; many fine and medium roots; few fine mica flakes; patchy clay films on faces of peds; strongly acid; clear, smooth boundary.

B21t—12 to 18 inches, brownish-yellow (10YR 6/6) sandy clay; few, medium, distinct mottles of yellowish red (5YR 5/8); moderate, medium, angular blocky structure; firm; common fine and medium roots; common fine mica flakes; discontinuous clay films on ped faces; strongly acid; gradual, wavy boundary.

B22t—18 to 31 inches, brownish-yellow (10YR 6/6) sandy clay; common, medium, distinct mottles of yellowish red (5YR 5/8) and red (2.5YR 4/8) and few, fine, faint mottles of pale brown and light gray; moderate, medium, angular blocky structure; firm, slightly plastic; few fine roots; common fine mica flakes; discontinuous clay films; strongly acid; gradual, wavy boundary.

B3t—31 to 50 inches, sandy clay loam; mottled brownish yellow (10YR 6/6), yellowish red (5YR 5/8), red (2.5YR 4/8), strong brown (7.5YR 5/8), and light gray (10YR 7/1); moderate, medium, subangular blocky structure; firm; discontinuous clay films on faces of peds; few lenses of sandy clay; strongly acid; gradual, wavy boundary.

C—50 to 68 inches, sandy clay loam; coarsely mottled brownish yellow (10YR 6/6), dark red (10R 3/6), weak red (10R 5/4), and pale-brown (10YR 6/3); massive; firm; discontinuous horizontal lenses of light reddish-brown (2.5YR 6/4) sandy loam 5 to 20 millimeters thick; fragments of light-gray (10YR7/1) sandy clay; strongly acid.

The A1 or Ap horizon is grayish-brown, dark grayish-brown, brown, or dark-brown loamy sand or sandy loam. It ranges from 4 to 8 inches in thickness. An A2 horizon of pale-brown or light yellowish-brown loamy sand or sandy loam, 2 to 4 inches thick, occurs in some places. The B horizon ranges from 35 to 55 inches in thickness. The B1t horizon is light yellowish brown, yellowish brown, light olive brown, strong brown, or yellowish red and ranges from 4 to 6 inches in thickness. The B21t horizon is brownish-yellow, yellowish-brown, strong-brown, yellowish-red, or red sandy clay or clay that has few distinct mottles. The B22t horizon is brownish-yellow, yellowish-brown, strong-brown, yellowish-red, or red sandy clay or clay that is highly mottled in shades of yellow, red, brown, and gray. The content of clay in the B2t horizon ranges from 35 to 50 percent and the content of silt is less than 30 percent. The B3t horizon is mottled sandy clay loam or sandy clay. The C horizon is coarsely mottled and has discontinuous horizontal lenses of sandy clay, sandy loam, or loamy sand. In some places strata of platelike clay occur in the lower part of the C horizon. Reaction ranges from strongly to very strongly acid throughout. The water table is at a depth of more than 72 inches.

Gritney soils are associated with Dothan, Fuquay, and Orangeburg soils. They have a higher content of clay in the Bt horizon than all of those soils. They do not have plinthite in the Bt horizon, but the Dothan and Fuquay soils do.

Gritney loamy sand, 2 to 5 percent slopes (GrB).—This is a well-drained soil on knolls and short side slopes. The water table is at a depth of more than 68 inches. The profile of this soil is the one described as representative of the series.

Included with this soil in mapping are a few small areas of Dothan loamy sand, 2 to 5 percent slopes, Faceville sandy loam, 2 to 5 percent slopes, and Tifton loamy sand, 2 to 5 percent slopes. Also included are areas of soils that have a surface layer of loamy sand and a subsoil of mottled, compact, brittle sandy clay loam. Other inclusions are a few small areas of soils that are severely eroded, a few areas that have slopes of 5 to 8 percent, and some areas of Gritney soils that have a surface layer of sandy loam.

Among the cultivated crops to which this soil is moderately suited are corn, peanuts, soybeans, and watermelons. It is also suited to Coastal bermudagrass, bahiagrass, and small grain.

The hazard of erosion is one of the main limitations to the use of this soil for cultivated crops. Runoff is medium to rapid. The root zone is restricted by the depth to the clayey, slowly permeable subsoil. Cultivated crops are affected by the lack of available moisture in the shallow root zone during dry seasons. Productivity of crops can be improved by using a cropping sequence that includes close-growing, soil-improving crops in rotation with row crops. All residue should be left on the surface to help control erosion. All cultivation should be on the contour. Terraces and stabilized waterways should be constructed and maintained to reduce runoff and to help control erosion. Liming and regular fertilizing are needed. Capability unit IIIe–3; woodland suitability group 3o1.

Gritney loamy sand, 5 to 8 percent slopes (GrC).—This is a well-drained soil on short, choppy slopes.

Included with this soil in mapping are small areas of Dothan loamy sand, 5 to 8 percent slopes, Faceville sandy loam, 5 to 8 percent slopes, Orangeburg loamy sand, 5 to 8 percent slopes, and Tifton loamy sand, 5 to 8 percent slopes. Also included are a few small areas of soil that are similar to Gritney soils except that they have a surface

layer more than 11 inches thick, a few areas that are severely eroded, and a few areas of Gritney loamy sand, 2 to 5 percent slopes. Other inclusions are a few areas of a soil that has a surface layer of loamy coarse sand and a subsoil of compact, brittle sandy clay loam and some areas of Gritney soils that have a surface layer of sandy loam.

Among the cultivated crops to which this soil is poorly suited are corn, peanuts, or soybeans. Among the pasture and hay crops to which it is moderately suited are Coastal bermudagrass, bahiagrass, and small grain.

This soil is severely limited for cultivation because of the hazard of erosion and the shallow root zone. Runoff is rapid, and the soil is droughty and hard during dry seasons. The shallow root zone restricts root development and affects plant growth. The soil should be cultivated only occasionally, and it should always be contour cultivated. It is not well suited to terraces. Strips of close-growing crops should be used on long slopes to retard runoff. Capability unit IVe-1; woodland suitability group 3o1.

Kenansville Series

The Kenansville series consists of gently sloping, well-drained soils that formed in sandy fluvial sediments. These soils are in the higher positions on river and stream terraces.

In a representative profile the surface layer is dark grayish-brown fine sand about 6 inches thick. The subsurface layer is very pale brown fine sand about 19 inches thick. The upper 12 inches of the subsoil is yellowish-brown fine sandy loam, and the lower 11 inches is slightly mottled, reddish-yellow fine sandy loam. The underlying material is pale-yellow fine sand that has common white and yellowish-brown mottles and extends to a depth of 75 inches.

Available water capacity is low to a depth of 25 inches, moderate between depths of 25 and 48 inches, and low below a depth of 48 inches. Permeability is rapid to a depth of 25 inches, moderately rapid between depths of 25 and 48 inches, and rapid below a depth of 48 inches. Natural fertility is low.

Representative profile of Kenansville fine sand, approximately 2.0 miles north of the city limits of Caryville and 0.5 mile west of State Highway No. 179 on the west side of the good motor road in the SW¼SW¼ sec. 35, T. 5 N., R. 16 W.:

A1—0 to 6 inches, dark grayish-brown (10YR 4/2) fine sand; weak, fine, granular structure; many medium and fine roots; strongly acid; gradual, smooth boundary.

A2—6 to 25 inches, very pale brown (10YR 7/4) fine sand; few, fine, faint mottles of light gray (10YR 7/2); single grained; loose; common medium and fine roots; sand grains dominantly clean; strongly acid; gradual, wavy boundary.

B2t—25 to 37 inches, yellowish-brown (10YR 5/6) fine sandy loam; weak, medium, subangular blocky structure; friable; few medium and fine roots; thin discontinuous clay films on ped faces; strongly acid; gradual, wavy boundary.

B3t—37 to 48 inches, reddish-yellow (7.5YR 6/6) fine sandy loam; few, fine, distinct mottles of yellowish brown (10YR 5/6); weak, fine, subangular blocky structure; friable; few fine roots; sand grains coated and bridged with clay; strongly acid; gradual, wavy boundary.

C—48 to 75 inches, pale-yellow (2.5Y 8/4) fine sand; common, medium, distinct mottles of white (2.5Y 8/2); few fine nodules of yellowish-brown (10YR 5/8) fine sandy loam; single grained; loose; sandy grains dominantly clean; strongly acid.

The A1 horizon is dark grayish-brown, grayish-brown, or gray loamy fine sand, sand, or fine sand. It ranges from 3 to 8 inches in thickness. The A2 horizon is light yellowish-brown, yellowish-brown, brown, or very pale brown loamy fine sand, sand, or fine sand. It ranges from 17 to 32 inches in thickness. A few profiles have a B1 horizon of brownish-yellow, yellowish-brown, or strong-brown fine sandy loam that ranges from 2 to 8 inches in thickness. The B2t horizon is yellowish-brown, brownish-yellow, or strong-brown fine sandy loam or sandy clay loam. It ranges from 10 to 25 inches in thickness. The B3t horizon is yellowish-brown, light yellowish-brown, or reddish-yellow fine sandy loam or sandy clay loam. The C horizon is pale-yellow, yellow, very pale brown, light yellowish-brown, brownish-yellow, or strong-brown fine sand or loamy fine sand. It has few to many mottles in shades of white, yellow, red, or brown and extends to a depth of 75 inches. Reaction is strongly acid to very strongly acid throughout. The water table is at a depth of more than 75 inches.

Kenansville soils are associated with Maxton, Troup, and Lucy soils. They are yellower than those soils; they have a thicker A2 horizon than Maxton soils; and they have a thinner A2 horizon than Troup soils. The subsoil of Kenansville soils is underlain by fine sand, but that of the Lucy soils is underlain by sandy clay loam.

Kenansville fine sand (Ke).—This is a well-drained soil in the higher positions on river and stream terraces. It has slopes of 2 to 5 percent. The water table is at a depth of more than 75 inches.

Included with this soil in mapping are a few small areas of Troup sand, Maxton loamy fine sand, Lucy loamy sand, and Fuquay loamy sand. Also included are a few small areas of soils that are similar to Kenansville soils, except that the combined thickness of the surface and subsurface layers is less than 20 inches, and some areas of Kenansville soils that have a surface layer of loamy fine sand.

Among the cultivated crops to which this soil is suited are peanuts, soybeans, and watermelons. Among the pasture and hay crops to which it is well suited are Coastal bermudagrass, bahiagrass, and small grain.

Droughtiness is the main limitation for crop production. The lack of moisture in the major root zone during hot summer months often causes crop damage. Moderate conservation practices are needed to improve the content of moisture in this soil. Large amounts of crop residue should be returned. A cropping sequence that includes perennial grasses or cover crops is desirable. The practice of planting such crops as corn in a mulched soil is useful in controlling erosion and improving the soil condition. Capability unit IIs-2; woodland suitability group 3s2.

Lakeland Series

The Lakeland series consists of nearly level to gently sloping, excessively drained soils that formed in thick beds of sandy marine deposits along the Choctawhatchee River.

In a representative profile the surface layer is grayish-brown sand about 4 inches thick. The underlying material extends to a depth of 84 inches. In sequence from the top, this material is 5 inches of yellowish-brown sand; 35 inches of yellowish-brown sand that has few faint mottles; 13 inches of brownish-yellow sand that has few pale-brown mottles; and 27 inches of very pale brown sand that has

few light yellowish-brown, yellowish-brown, and pale-brown mottles.

Available water capacity is very low to low throughout. Permeability is rapid throughout. Natural fertility is low.

Representative profile of Lakeland sand, approximately 3.0 miles north of Ponce de Leon and 0.75 mile east of State Highway No. 81 on the south side of the good motor road in the SE¼SW¼ sec. 9, T. 4 N., R. 17 W.:

A1—0 to 4 inches, grayish-brown (10YR 5/2) sand; single grained; loose; common fine roots; few, fine, distinct streaks of dark grayish brown; some clean sand grains; strongly acid; clear, smooth boundary.

C1—4 to 9 inches, yellowish-brown (10YR 5/4) sand; single grained; loose; few fine roots; few, fine, distinct, dark grayish-brown tongues extending downward; strongly acid; gradual, smooth boundary.

C2—9 to 44 inches, yellowish-brown (10YR 5/6) sand; few, fine, faint, very pale brown mottles; single grained; loose; few fine roots; sand grains are well coated; strongly acid; gradual, smooth boundary.

C3—44 to 57 inches, brownish-yellow (10YR 6/6) sand; few, medium, distinct, very pale brown mottles; single grained; loose; sand grains are well coated; strongly acid; gradual, smooth boundary.

C4—57 to 84 inches, very pale brown (10YR 7/4) sand; few, fine, distinct, light yellowish-brown, yellowish-brown, and pale-brown mottles; single grained; loose; sand grains dominantly clean; strongly acid.

The A1 or Ap horizon is dark grayish-brown, grayish-brown, gray, or dark-gray sand or fine sand. It ranges from 2 to 6 inches in thickness. The C horizon is fine sand or sand to a depth of more than 84 inches. The upper part of the C horizon is yellowish brown, brownish yellow, and yellow. The lower part is light yellowish brown, pale brown, or very pale brown. The C2 and C3 horizons have a few to common, pale-brown, very pale brown, or white mottles. The C4 horizon has few to common, light yellowish-brown, yellowish-brown, pale-brown, or white mottles. The content of strongly cemented ironstone concretions ranges from 0 to 5 percent, by volume. Reaction is strongly acid or very strongly acid throughout. The water table is at a depth of more than 84 inches.

Lakeland soils are associated with Fuquay, Bonifay, Troup, and Chipley soils. They lack the Bt horizon that Fuquay, Bonifay, and Troup soils have. They are better drained than Chipley soils.

Lakeland sand (Ld).—This is an excessively drained soil. It has slopes of 0 to 5 percent. The water table is at a depth of more than 84 inches.

Included with this soil in mapping are a few small areas of Troup sand, Bonifay sand, Fuquay loamy sand, Chipley sand, and Lucy loamy sand. Also included are some areas of Lakeland soils that have a surface layer of fine sand.

Among the cultivated crops to which this soil is poorly suited are corn, peanuts, soybeans, and watermelons. Among the pasture and hay crops to which it is moderately suited are bahiagrass, Coastal bermudagrass, and small grain.

Droughtiness is the main limitation to the use of this soil for cultivated crops. Very low or low available water capacity throughout makes the soil very droughty in dry periods. A cropping sequence that includes regular use of close-growing crops is needed to improve soil condition. All crop residue should be returned to the soil. Placing row crops on the contour helps retain water and retard erosion. Terracing on this soil is not practical. Liming and frequent applications of fertilizers are needed for the best productivity. Capability unit IVs-1; woodland suitability group 3s2.

Leefield Series

The Leefield series consists of nearly level to gently sloping, somewhat poorly drained soils that formed in thick beds of loamy marine deposits. These soils are along narrow drainageways and small streams and around depressions.

In a representative profile the surface layer is dark grayish-brown loamy sand about 8 inches thick. The subsurface layer is loamy sand that is grayish brown in the upper 4 inches and pale brown in the lower 11 inches. The subsoil extends to a depth of 65 inches. The upper 5 inches of the subsoil is light yellowish-brown sandy clay loam that has few yellowish-brown and light-gray mottles. Next is 14 inches of light yellowish-brown sandy clay loam that has common mottles in shades of brown, gray, and red. The lower 33 inches is sandy clay loam mottled in shades of brown, gray, and red.

Available water capacity is low to a depth of about 23 inches and moderate below this depth. Permeability is rapid to a depth of about 23 inches and moderately slow below this depth. Natural fertility is low.

Representative profile of Leefield loamy sand, approximately 2 miles northwest of Bethlehem Church on the south side of a good motor road in the SE¼SE¼ sec. 11, T. 6 N., R. 15 W.:

Ap—0 to 8 inches, dark grayish-brown (10YR 4/2) loamy sand; weak, medium, granular structure; very friable; few fine roots; few clean sand grains; strongly acid; clear, smooth boundary.

A21—8 to 12 inches, grayish-brown (10YR 5/2) loamy sand; weak, medium, granular structure; very friable; few fine roots; strongly acid; gradual, smooth boundary.

A22—12 to 23 inches, pale-brown (10YR 6/3) loamy sand; weak, medium, granular structure; very friable; few fine roots; many clean sand grains; strongly acid; gradual, wavy boundary.

B1—23 to 28 inches, light yellowish-brown (2.5Y 6/4) sandy clay loam; few, medium, distinct mottles of yellowish brown and few, fine, faint mottles of light gray; weak, medium, subangular blocky structure; friable; few fine roots; sand grains coated and bridged with clay; strongly acid; gradual, wavy boundary.

B21t—28 to 42 inches, light yellowish-brown (2.5Y 6/4) sandy clay loam; common, medium, distinct mottles of yellowish brown (10YR 5/6), pale brown (10YR 6/3), light gray (10YR 7/1 or 7/2), strong brown (7.5YR 5/6), and yellowish red (5YR 5/6); weak, medium, subangular blocky structure; friable; thin discontinuous clay films on ped faces; estimated 3 percent, by volume, is firm, brittle plinthite; strongly acid; gradual, wavy boundary.

B22t—42 to 60 inches, sandy clay loam; mottled yellowish brown (10YR 5/8), light yellowish brown (10YR 6/4), light gray (10YR 7/1), yellow (10YR 7/8), strong brown (7.5YR 5/6), yellowish red (5YR 5/6), and red (2.5YR 5/6); moderate, medium, subangular blocky structure; friable; thin discontinuous clay films; estimated 10 percent, by volume, is firm, brittle plinthite; strongly acid; gradual, wavy boundary.

B23t—60 to 65 inches, sandy clay loam; coarsely mottled light yellowish brown (2.5Y 6/4), light gray (10YR 7/2 or 7/1), strong brown (7.5YR 5/6), and red (2.5YR 5/6); moderate, medium, subangular blocky structure; friable; slightly sticky and plastic; thin discontinuous clay films; estimated 5 percent, by volume, is firm, brittle plinthite; strongly acid.

The A1 or Ap horizon is very dark gray, dark-gray, very dark grayish-brown, or dark grayish-brown loamy sand or sand. It ranges from 4 to 9 inches in thickness. The A2 horizon is loamy sand or sand and ranges from 13 to 22 inches in thick-

ness. The upper part is grayish brown or light brownish gray, and the lower part is very pale brown or pale brown. In some profiles the A2 horizon has few mottles in shades of brown, yellow, or gray.

The B horizon is sandy clay loam or sandy loam. The B1 horizon is light yellowish brown or yellowish brown and ranges from 3 to 5 inches in thickness. The B21t horizon is light yellowish brown or yellowish brown. The B1 and B21t horizons have few to common mottles in shades of brown, yellow, and gray. The B22t horizon is light yellowish brown or yellowish brown and has common to many mottles in shades of yellow, brown, red, and gray. The B23t horizon, and in some profiles the B22t horizon, has coarse mottles in shades of yellow, brown, gray, and red. The content of firm, brittle plinthite in the B22t and B23t horizons ranges from 5 to 20 percent. Reaction is strongly acid or very strongly acid throughout. The water table is at a depth of 15 to 30 inches for 2 to 3 months in most years.

The Leefield soils are associated with Ardilla, Stilson, Fuquay, and Albany soils. They have a thicker A horizon than Ardilla soils. They are more poorly drained than Stilson and Fuquay soils. Leefield soils have a thinner A horizon than the Albany soils.

Leefield loamy sand (Le).—This is a somewhat poorly drained soil that is along narrow drainageways and small streams and around depressions. It has slopes of 0 to 5 percent. The water table is at a depth of 15 to 30 inches for 2 to 3 months in most years.

Included with this soil in mapping are a few small areas of Ardilla loamy sand, Albany sand, Fuquay loamy sand, Pansey loamy sand, and Stilson loamy sand. Also included are some areas of Leefield soils that have a surface layer of sand.

Among the cultivated crops to which this soil is suited are corn, soybeans, and watermelons. It is well suited to Coastal bermudagrass, bahiagrass, and small grain.

Surface drainage should be installed and maintained where this soil is used for cultivated crops. The hazard of erosion is slight, but a cropping sequence that includes close-growing, soil-improving crops is needed to maintain the organic-matter content. All crop residue should be returned to the soil. This soil requires liming and regular fertilizing. Capability unit IIw-2; woodland suitability group 3w2.

Lucy Series

The Lucy series consists of nearly level to sloping, well-drained soils that formed in thick beds of loamy marine deposits. These soils are on broad ridges and along side slopes.

In a representative profile the surface layer is dark grayish-brown loamy sand about 7 inches thick. The subsurface layer is strong-brown loamy sand in the upper 7 inches and yellowish-red loamy sand in the lower 14 inches. The subsoil extends to a depth of 80 inches. The upper 9 inches of the subsoil is red sandy loam, and the lower 43 inches is red sandy clay loam.

Available water capacity is low to a depth of about 28 inches and moderate below this depth. Permeability is rapid to a depth of about 28 inches, moderately rapid between depths of 28 and 37 inches, and moderate below a depth of 37 inches. Natural fertility is low.

Representative profile of Lucy loamy sand, 1 to 8 percent slopes, approximately 0.75 mile southeast of Sandy Creek Church on the west side of a good motor road in the NE¼NE¼ sec. 35, T. 5 N., R. 16 W.:

A1—0 to 7 inches, dark grayish-brown (10YR 4/2) loamy sand; few streaks of dark brown (10YR 4/3); weak, medium, granular structure; very friable; many fine and medium roots; strongly acid; gradual, wavy boundary.

A2—7 to 14 inches, strong-brown (7.5YR 5/6) loamy sand; few, fine, faint mottles of light brown; weak, medium, granular structure; very friable; common medium and fine roots; strongly acid; gradual, smooth boundary.

A3—14 to 28 inches, yellowish-red (5YR 4/6) loamy sand; few, fine, faint mottles of light brown; weak, medium, granular structure; very friable; common medium and fine roots; strongly acid; gradual, wavy boundary.

B1t—28 to 37 inches, red (2.5YR 4/8) sandy loam; few, fine, faint mottles of light brown; weak, medium, subangular blocky structure; friable; few medium and fine roots; strongly acid; gradual, smooth boundary.

B2t—37 to 80 inches, red (10YR 4/6) sandy clay loam; weak, medium, subangular blocky structure; friable; thin discontinuous clay films on ped faces; strongly acid.

The A1 or Ap horizon is dark grayish brown, grayish brown, or dark brown and ranges from 6 to 10 inches in thickness. The A2 horizon is yellowish brown, light yellowish brown, brownish yellow, or strong brown. The A3 horizon is yellowish-red loamy sand or sand and is as much as 15 inches thick. The combined thickness of the A2 and A3 horizons ranges from 14 to 30 inches. The B1t horizon is yellowish-red or red sandy loam or sandy clay loam. It ranges from 4 to 18 inches in thickness. The B2t horizon is yellowish-red to red sandy loam or sandy clay loam. In some places the B2t horizon has few to common mottles of strong brown or yellowish red. Reaction is strongly acid or very strongly acid throughout. The content of small, cemented ironstone concretions ranges from 0 to 5 percent, by volume, throughout. The water table is at a depth of more than 80 inches.

Lucy soils are associated with Dothan, Orangeburg, and Troup soils. Lucy soils have a thicker A horizon than Dothan and Orangeburg soils and have a thinner A horizon than Troup soils.

Lucy loamy sand, 1 to 8 percent slopes (LuC).—This is a well-drained soil on broad ridges and long side slopes. The water table is at a depth of more than 80 inches.

Included with this soil in mapping are a few small areas of Orangeburg loamy sand, Dothan loamy sand, 2 to 5 percent slopes, Dothan loamy sand, 5 to 8 percent slopes, Faceville sandy loam, Troup sand, Fuquay loamy sand, and Stilson loamy sand.

Among the cultivated crops to which this soil is suited are corn, peanuts, soybeans, and watermelons. Among the pasture and hay crops to which the soil is suited are Coastal bermudagrass, bahiagrass, and small grain.

Droughtiness is the main limitation, and moderate conservation practices are needed to improve the soil for crop production. The lack of moisture in the major root zone during hot, dry months in summer often causes crop damage. A cropping sequence that includes perennial grasses or cover crops that produce large amounts of crop residue should be used. Fertilizer leaches rapidly and should be applied in small but frequent applications. Moderate erosion control practices are needed. Contour cultivation, along with alternate strips of perennial grass, is needed to retard runoff and erosion. Capability unit IIs-2; woodland suitability group 3s2.

Maxton Series

The Maxton series consists of gently sloping, well-drained soils that formed in loamy marine and fluvial deposits. These soils are at higher elevations adjacent to the Choctawhatchee River.

In a representative profile the surface layer is dark grayish-brown loamy fine sand about 6 inches thick. The sub-

surface layer is yellowish-brown loamy fine sand about 3 inches thick. The subsoil is 32 inches thick. In sequence from the top, it is 5 inches of brown fine sandy loam; 10 inches of strong-brown sandy clay loam; 10 inches of yellowish-red sandy clay loam; and 7 inches of yellowish-red sandy loam. The underlying material extends to a depth of 65 inches. It is yellow sand that has distinct mottles of strong brown and yellowish red.

Available water capacity is low to a depth of about 9 inches, moderate between depths of 9 and 41 inches, and low below a depth of 41 inches. Permeability is rapid to a depth of about 9 inches, moderate between depths of 9 and 41 inches, and rapid below a depth of 41 inches. Natural fertility is low.

Representative profile of Maxton loamy fine sand, approximately 0.25 mile north of Sikes Creek and 0.75 mile west of State Highway 179 in the SE¼NE¼ sec. 7, T. 5 N., R. 16 W.:

A1—0 to 6 inches, dark grayish-brown (10YR 4/2) loamy fine sand; weak, medium, granular structure; very friable; many fine roots; strongly acid; clear, smooth boundary.

A2—6 to 9 inches, yellowish-brown (10YR 5/4) loamy fine sand; weak, fine, granular structure; very friable; common fine roots; strongly acid; clear, smooth boundary.

B1—9 to 14 inches, brown (7.5YR 5/4) fine sandy loam; weak, medium, subangular blocky structure; friable; few fine roots; sand grains coated and bridged with clay; strongly acid; gradual, smooth boundary.

B21t—14 to 24 inches, strong-brown (7.5YR 5/8) sandy clay loam; weak, medium, subangular blocky structure; friable; few fine roots; sand grains coated and bridged with clay; strongly acid; gradual, wavy boundary.

B22t—24 to 34 inches, yellowish-red (5YR 5/6) sandy clay loam; moderate, medium, subangular blocky structure; friable; thin discontinuous clay films on ped faces; strongly acid; gradual, wavy boundary.

B3—34 to 41 inches, yellowish-red (5YR 5/6) fine sandy loam; weak, medium, subangular blocky structure; friable; sand grains coated and bridged with clay; strongly acid; gradual, wavy boundary.

IIC—41 to 65 inches, yellow (10YR 7/6) sand; common, medium, distinct mottles of strong brown (7.5YR 5/6) and yellowish red (5YR 5/6); single grained; loose; strongly acid.

The A1 or Ap horizon is dark grayish-brown, gray, or grayish-brown loamy fine sand or loamy sand. It ranges from 4 to 8 inches in thickness. Some profiles have an A2 horizon that is yellow, yellowish-brown, light yellowish-brown, or pale-brown loamy fine sand or loamy sand. It ranges from 5 to 8 inches in thickness. The B1 horizon is yellowish-red, brown, or strong-brown fine sandy loam or sandy clay loam. It ranges from 2 to 5 inches in thickness. The B2t horizon is red, yellowish-red, or strong-brown sandy clay loam. It ranges from 10 to 20 inches in thickness. The B3 horizon is yellowish-red or red fine sandy loam or sandy clay loam. It ranges from 2 to 8 inches in thickness. The IIC horizon is yellow, yellowish-brown, or strong-brown sand or loamy sand that is stratified in many places. Reaction is strongly acid to very strongly acid throughout. The water table is at a depth of more than 72 inches.

Maxton soils are associated with Kenansville, Lucy, and Troup soils. They differ from those soils in having an A horizon that is less than 20 inches thick.

Maxton loamy fine sand (Md).—This is a well-drained soil at higher elevations adjacent to the Choctawhatchee River. It has slopes of 2 to 5 percent. The water table is at a depth of more than 72 inches.

Included with this soil in mapping are a few small areas of Kenansville fine sand, Lucy loamy sand, Troup sand, Stilson loamy sand, and Ardilla loamy sand. Also included are a few small areas of soils that have a clayey subsoil and soils that are similar to Maxton loamy fine sand except that the combined thickness of the surface and subsurface layers is more than 20 inches. Other inclusions are some areas of Maxton soils that have a surface layer of loamy sand.

Among the cultivated crops to which this soil is suited are corn, soybeans, peanuts, and watermelons. Among the pasture and hay crops to which it is well suited are bahiagrass, Coastal bermudagrass, and small grain.

The hazard of erosion is a moderate limitation to the use of this soil for cultivated crops. This soil can be protected against erosion by using a cropping sequence that includes close-growing, soil-improving crops and winter cover crops that produce large amounts of crop residue. Crop residue should be returned to the soil. All cultivation should be on the contour. Stabilized waterways and terraces are useful in reducing runoff and erosion, and parallel strips of perennial grass sod are effective in controlling runoff and erosion. Liming and regular fertilizing are needed. Capability unit IIe-1; woodland suitability group 2o7.

Orangeburg Series

The Orangeburg series consists of gently sloping to sloping, well-drained soils that formed in thick beds of loamy marine deposits. These soils are on broad tops and long, narrow sides of ridges.

In a representative profile the surface layer is dark grayish-brown loamy sand about 5 inches thick. The subsurface layer is brown loamy sand about 5 inches thick. The subsoil extends to a depth of 108 inches. The upper 7 inches of the subsoil is yellowish-red sandy loam, and the lower part is red sandy clay loam.

The available water capacity is low to a depth of about 10 inches and moderate below this depth. Permeability is moderately rapid to a depth of about 21 inches and moderate below this depth. Natural fertility is low.

Representative profile of Orangeburg loamy sand, 2 to 5 percent slopes, approximately 4.5 miles north of the city limits of Ponce de Leon on the west side of State Highway No. 81 in the SW¼SE¼ sec. 32, T. 5 N., R. 17 W.:

A1—0 to 5 inches, dark grayish-brown (10YR 4/2) loamy sand; weak, medium, granular structure; very friable; many fine and medium roots; strongly acid; clear, smooth boundary.

A2—5 to 10 inches, brown (7.5YR 4/4) loamy sand; weak, medium, granular structure; very friable; common medium and fine roots; strongly acid; gradual, smooth boundary.

B1t—10 to 17 inches, yellowish-red (5YR 4/8) sandy loam; moderate, medium, crumb structure; friable; few medium and fine roots; sand grains coated and bridged with clay; strongly acid; gradual, smooth boundary.

B21t—17 to 21 inches, red (2.5YR 4/6) sandy clay loam; moderate, medium, subangular blocky structure; friable; few medium and fine roots; sand grains coated and bridged with clay; strongly acid; gradual, smooth boundary.

B22t—21 to 108 inches, red (2.5YR 4/6) sandy clay loam; moderate, medium, subangular blocky structure; friable; thin discontinuous clay films on ped faces; few small quartz pebbles and ironstone concretions; strongly acid; gradual, smooth boundary.

The A1 or Ap horizon is dark grayish-brown, grayish-brown, or brown loamy sand, loamy fine sand, sandy loam, or fine sandy loam. It ranges from 5 to 9 inches in thickness. The A2 horizon is yellowish-brown or brown loamy sand, loamy fine

sand, sandy loam, or fine sandy loam. It ranges from 0 to 9 inches in thickness. A few profiles have an A3 horizon of brown or grayish-brown loamy sand, sandy loam, or fine sandy loam that ranges from 3 to 6 inches in thickness. The B1t horizon is strong-brown, yellowish-red, brown, or red sandy loam, fine sandy loam, or sandy clay loam. It ranges from 3 to 10 inches in thickness. The B2t horizon is yellowish-red or red sandy clay loam, sandy loam, or fine sandy loam that extends to a depth of more than 65 inches. The content of clay in this horizon ranges from 18 to 35 percent. Some profiles have few to common mottles in shades of red, yellow, and brown in the lower part of the B2t horizon. Soil reaction is strongly acid to very strongly acid throughout. Cemented ironstone concretions are 0 to 5 percent, by volume, throughout. The water table is at a depth of more than 108 inches.

Orangeburg soils are associated with Dothan, Faceville, Fuquay, Lucy, and Stilson soils. They lack the plinthite and yellowish-brown colors in the lower part of the B horizon of the Dothan soils. They have loamy Bt horizons rather than clayey Bt horizons that Faceville soils have. Orangeburg soils have a thinner A horizon than Fuquay, Lucy, and Stilson soils.

Orangeburg loamy sand, 2 to 5 percent slopes (OrB).—This is a well-drained soil on broad ridges. It has the profile described as representative for the series. The water table is at a depth of more than 108 inches.

Included with this soil in mapping are a few small areas of Lucy loamy sand, Dothan loamy sand, 2 to 5 percent slopes, Faceville sandy loam, 2 to 5 percent slopes, and Gritney loamy sand, 2 to 5 percent slopes. Also included are a few small areas of eroded soils and a few small areas of severely eroded soils that are cut by shallow gullies. Other inclusions are some areas of Orangeburg soils that have a surface layer of loamy fine sand or sandy loam.

Among the cultivated crops to which this soil is suited are corn, peanuts, soybeans, and watermelons. Among the pasture and hay crops to which it is well suited are Coastal bermudagrass, bahiagrass, and small grain.

Runoff is moderate, and the major hazard to cultivation is erosion. Runoff can be reduced and erosion controlled by such conservation measures as contour cultivation, terraces, and stabilized waterways. A cropping sequence that includes a close-growing crop and winter cover crops is needed to protect the soil from erosion and maintain the organic-matter content. All crop residue should be returned to the soil. Liming and regular fertilizing are needed. Capability unit IIe–1; woodland suitability group 2o1.

Orangeburg loamy sand, 5 to 8 percent slopes (OrC).—This is a well-drained soil on long, narrow side slopes.

Included with this soil in mapping are a few small areas of Lucy loamy sand, Fuquay loamy sand, Troup sand, Faceville sandy loam, 5 to 8 percent slopes, Dothan loamy sand, 5 to 8 percent slopes, and Ardilla loamy sand. Also included are a few small areas of soils that have a dark reddish-brown surface layer and some small, severely eroded spots. Other inclusions are some areas of Orangeburg soils that have a surface layer of loamy fine sand or sandy loam.

Among the cultivated crops to which this soil is moderately suited are corn, peanuts, soybeans, and watermelons. Among the pasture and hay crops to which it is suited are Coastal bermudagrass, bahiagrass, and small grain.

Runoff is moderate to rapid, and the major hazard to the use of this soil for cultivated crops is erosion. Erosion can be reduced by using contour cultivation, terraces, and stabilized waterways. A cropping sequence including close-growing crops and winter cover crops in rotation with row crops is needed to reduce erosion, and the use of parallel strips of perennial grass on the contour makes the cropping sequence more effective. All crop residue should be returned to the soil. Regular liming and fertilizing are needed. Capability unit IIIe–1; woodland suitability group 2o1.

Pansey Series

The Pansey series consists of nearly level, poorly drained soils that formed in thick beds of loamy marine deposits. These soils are on long narrow stream bottoms, in drainageways, and in wide depressions.

In a representative profile the surface layer is very dark gray loamy sand about 7 inches thick. The subsurface layer is grayish-brown loamy sand about 5 inches thick. The subsoil extends to a depth of 69 inches. In sequence from the top, it is 12 inches of light brownish-gray sandy loam that has few strong-brown mottles; 12 inches of light brownish-ish-gray sandy clay loam that has common yellowish-brown, yellow, and very pale brown mottles; 27 inches of light brownish-gray sandy clay loam that has many yellowish-brown, yellow, strong-brown, and red mottles; and 6 inches of reticulately mottled brown, strong-brown, yellowish-brown, gray, and red sandy clay loam.

The available water capacity is low to a depth of about 12 inches and moderate below this depth. Permeability is moderately rapid to a depth of about 24 inches and slow below this depth. Natural fertility is low.

Representative profile of Pansey loamy sand, approximately 0.75 mile southwest of Bethlehem School and 50 yards south of a good motor road in the NE¼NE¼ sec. 20, T. 6 N., R. 15 W.:

A1—0 to 7 inches, very dark gray (10YR 3/1) loamy sand; weak, medium, granular structure; very friable; many fine and medium roots; strongly acid; gradual, wavy boundary.

A2—7 to 12 inches, grayish-brown (10YR 5/2) loamy sand; weak, medium, granular structure; very friable; common fine and medium roots; strongly acid; clear, wavy boundary.

B1tg—12 to 24 inches, light brownish-gray (10YR 6/2) sandy loam; few, fine, distinct mottles of strong brown; weak, medium, subangular blocky structure; friable; few fine and medium roots; strongly acid; clear, wavy boundary.

B21tg—24 to 36 inches, light brownish-gray (10YR 6/2) sandy clay loam; common, medium, distinct mottles of yellowish brown (10YR 5/8), yellow (10YR 7/6), and very pale brown (10YR 7/3); weak, medium, subangular blocky structure; friable; few fine roots; strongly acid; gradual, wavy boundary.

B22tg—36 to 63 inches, light brownish-gray (10YR 6/2) sandy clay loam; many, medium, distinct mottles of yellowish brown (10YR 5/8), yellow (10YR 7/6), strong brown (7.5 5/8), and red (2.5YR 4/6 and 10R 4/6); moderate, medium, subangular blocky structure; friable; few fine roots; lenses of loamy sand along root channels; thin discontinuous clay films on ped faces; estimated 10 percent is firm plinthite; strongly acid; gradual, wavy boundary.

B23t—63 to 69 inches, sandy clay loam; reticulately mottled brown (10YR 5/3), strong brown (7.5YR 5/8), yellowish brown (10YR 5/8), gray (N 5/0), and red (10R 4/6); moderate, medium, subangular blocky structure; friable; thin discontinuous clay films on ped faces; estimated 5 percent is firm plinthite; strongly acid.

The A1 horizon is black, very dark gray, or dark gray and ranges from 3 to 8 inches in thickness. The A2 horizon is dark grayish brown, gray, light gray, grayish brown, or light grayish brown and ranges from 2 to 5 inches in thickness. The B1tg

horizon is light brownish-gray, grayish-brown, or light-gray sandy loam or sandy clay loam. It ranges from 4 to 12 inches in thickness and has few to common mottles in shades of brown and yellow. The B21tg and B22tg horizons are light brownish-gray or light-gray sandy clay loam or sandy loam that has common to many mottles in shades of brown, yellow, and red. The B23t horizon is reticulately mottled sandy clay loam or sandy loam, but in some places it is gray or light gray and has few mottles. The B2t horizon has 18 to 35 percent clay, and less than 20 percent of this horizon, by volume, is firm plinthite. Soil reaction is strongly to very strongly acid throughout. The water table is at a depth of 0 to 15 inches for 3 to 6 months in most years.

Pansey soils are associated with Ardilla, Leefield, and Stilson soils. They are more poorly drained than all of those soils.

Pansey loamy sand (Pa).—This is a nearly level, poorly drained soil along narrow stream bottoms and drainageways and in wide depressions. It is subject to flooding. The water table is at the surface or within 15 inches of the surface for 3 to 6 months in most years.

Included with this soil in mapping are a few small areas of Ardilla loamy sand, Plummer fine sand, Leefield loamy sand, Stilson loamy sand, and Albany sand. Also included are a few small areas of soils that are less than 5 percent plinthite in the lower part of the subsoil and soils that have slopes of 2 to 5 percent.

This soil is poorly suited to most cultivated crops. It is suited to such cultivated crops as corn and soybeans if it is managed intensively for water control. Otherwise, its use is restricted mainly to woodland and pasture. The soil is moderately suited to pasture and hay grasses. If drained and protected from flooding, it is suited to bahiagrass.

Wetness and the hazard of overflow are the major limitations to the use of this soil for cultivated crops and pasture. A water-control program for cultivated crops includes construction and maintenance of drainage ditches and dikes to prevent flooding. The hazard of erosion is slight if this soil is cultivated, but it is more productive if a cropping sequence is used that includes a rotation with close-growing, soil-improving crops. All crop residue should be returned to the soil. Liming and regular fertilizing are needed for cultivated crops and pasture. Pasture needs less intensive water control than cultivated crops.

Most of this soil is in forest consisting of mixed pine and hardwoods. Capability unit IVw-2; woodland suitability group 3w9.

Pantego Series

The Pantego series consists of nearly level, very poorly drained soils that formed in loamy marine deposits. These soils are in depressed areas that are swampy or ponded.

In a representative profile the surface layer is black loamy fine sand in the upper 8 inches and very dark gray loamy fine sand in the lower 5 inches. The subsoil extends to a depth of 62 inches. The upper 5 inches of the subsoil is gray sandy clay loam; the next 18 inches is gray sandy clay loam that has few brownish-yellow, strong-brown, and light-gray mottles; and the lower 26 inches is gray sandy clay loam that has common brownish-yellow and strong-brown mottles.

The available water capacity is low to a depth of about 13 inches and moderate below this depth. Permeability is moderately rapid to a depth of about 13 inches and moderate below this depth. Natural fertility is low. These soils receive drainage water from surrounding areas and have poor outlets; they are often ponded or swampy.

Representative profile of Pantego loamy fine sand in an area of the Pantego complex, approximately 2.5 miles east of Bonifay and 1.0 mile south of U.S. Highway No. 90 on the east side of a good motor road in the NE¼NE¼ sec. 9, T. 4 N., R. 14 W.:

A11—0 to 8 inches, black (10YR 2/1) loamy fine sand; weak, medium, granular structure; very friable; many fine roots; strongly acid; gradual, smooth boundary.

A12—8 to 13 inches, very dark gray (10YR 3/1) loamy fine sand; weak, medium, granular structure; many fine roots; strongly acid; clear, smooth boundary.

B21tg—13 to 18 inches, gray (10YR 5/1) sandy clay loam; weak, medium, subangular blocky structure; few, fine, faint tongues of very dark gray extending downward in root channels; friable; slightly sticky; thin discontinuous clay films on ped faces; very strongly acid; gradual, wavy boundary.

B22tg—18 to 36 inches, gray (10YR 5/1) sandy clay loam; few, fine, distinct mottles of brownish yellow, strong brown, and light gray; weak, medium, subangular blocky structure; friable; slightly sticky; few fine roots; thin discontinuous clay films on ped faces; very strongly acid; gradual, wavy boundary.

B23tg—36 to 62 inches, gray (10YR 6/1) sandy clay loam; common, medium, distinct mottles of brownish yellow (10YR 6/8) and strong brown (7.5YR 5/8); weak, medium subangular blocky structure; friable; slightly sticky; very strongly acid.

The A11 horizon is black or very dark gray loamy fine sand or fine sandy loam. The A12 horizon is very dark gray to dark-gray loamy fine sand or fine sandy loam. The A horizon ranges from 10 to 20 inches in thickness. A few profiles have a B1g horizon that is dark-gray or gray sandy loam. It ranges from 2 to 5 inches in thickness. The B2tg horizon is gray, light brownish-gray, or light-gray sandy clay loam or sandy loam. It contains 18 to 35 percent clay and less than 20 percent silt. Reaction is strongly or very strongly acid throughout. The water table is at a depth of 0 to 15 inches for 9 to 12 months in most years. Many areas are frequently ponded with shallow water.

Pantego soils are associated with Ardilla, Stilson, Pansey, and Plummer soils. They are more poorly drained than all of those soils. They do not have plinthite in the lower part of the B horizon that is present in Ardilla and Pansey soils. They lack the thick A horizon that Plummer soils have.

Pantego complex (Pg).—This complex is in low wet places. Water is ponded on the surface for much of the year in many places. The water table is within a depth of 15 inches, even in dry periods.

The composition of this mapping unit is more variable and the areas are generally much larger than those of most other units in the county. Mapping has been controlled well enough, however, for the anticipated uses of the soils.

About 70 percent of the complex is nearly level Pantego soils. About half of the remaining 30 percent is Ardilla, Pansey, and Plummer soils; 10 percent is soils that have a thin, black surface layer and a gray or light-gray subsoil; and 5 percent is soils that have a dark-colored surface layer, more than 20 inches thick, and a grayish-brown sandy clay loam subsoil. All of these soils occur in such intricate patterns that it is not practical to map them separately. The proportion and composition of each mapped area are variable.

Excessive wetness and flooding make the soils of this complex unsuited to cultivated crops, and drainage is generally not feasible. The soils are poorly suited to pasture and hay grasses. Pasture of water-tolerant grasses can be improved, but land clearing is required for establishment. Some areas can be made into farm ponds or lakes (fig. 6).

Figure 6.—An area of the Pantego complex that was dammed to form Lake Victor. The lake is stocked with bream, shellcrackers, bass, and channel catfish.

Most areas are woodland. Cypress, bay, and gum are the principal trees. Capability unit Vw–2; woodland suitability group 2w9.

Plummer Series

The Plummer series consists of nearly level, poorly drained soils that formed in thick beds of sandy marine deposits. These soils are in depressed areas and drainageways.

In a representative profile the surface layer is very dark gray fine sand about 6 inches thick. The subsurface layer is dark-gray, gray, and light-gray fine sand about 38 inches thick. The subsoil is light-gray fine sandy loam that extends to a depth of 65 inches.

The available water capacity is low to a depth of about 44 inches and moderate below this depth. Permeability is rapid to a depth of about 44 inches and moderate below this depth. Natural fertility is low.

Representative profile of Plummer fine sand, 3.5 miles west of Ponce de Leon and 0.25 mile north of the intersection of State Highway No. 10A and State Highway No. 81A in the SW¼NE¼ sec. 24, T. 3 N., R. 18 W.:

A1—0 to 6 inches, very dark gray (10YR 3/1) fine sand; weak, fine, granular structure; very friable; many fine roots; very strongly acid; gradual, wavy boundary.

A21—6 to 10 inches, dark-gray (10YR 4/1) fine sand; common, medium, distinct streaks of very dark gray; single grained; loose, nonsticky; common fine roots; very strongly acid; gradual, wavy boundary.

A22g—10 to 32 inches, light-gray (10YR 6/1) fine sand; common, medium, faint mottles of gray (10YR 5/1) and few, fine, distinct, dark streaks; single grained; loose, nonsticky; few fine roots; sand grains dominantly clean; very strongly acid; gradual, smooth boundary.

A23g—32 to 44 inches, light-gray (10YR 7/1) fine sand; few, fine, faint mottles of gray; single grained; loose, nonsticky; sand grains dominantly clean; very strongly acid; gradual, smooth boundary.

Btg—44 to 65 inches, light-gray (10YR 7/1) fine sandy loam; lenses of loamy sand and nodules of sandy clay loam; massive; slightly sticky; sand grains are coated and bridged with clay; very strongly acid.

The A1 horizon is black or very dark gray fine sand or loamy fine sand. It ranges from 4 to 10 inches in thickness. The A2 horizon is dark-gray, gray, light-gray, grayish-brown, light brownish-gray, or white fine sand or loamy fine sand. It ranges from 30 to 54 inches in thickness. The Btg horizon is gray or light-gray fine sandy loam or sandy clay loam. In some places it has few to common mottles in shades of yellow and brown. Depth to this horizon ranges from 40 to 60 inches. Reaction is strongly acid to very strongly acid throughout. The water table is at a depth of 0 to 15 inches for 6 to 12 months in most years. Some areas are ponded with shallow water for 6 months or more.

Plummer soils are associated with Pansey, Pantego, and Stilson soils. They have a thicker A horizon than Pansey, Pantego, and Stilson soils. They are more poorly drained than Stilson soils.

Plummer fine sand (Pm).—This is a nearly level, poorly drained soil. It is in drainageways and depressions. A water table is within a depth of 0 to 15 inches for 6 to 12 months in most years. In some places water frequently accumulates and forms shallow ponds for 6 months or more.

Included with this soil in mapping are a few small areas of Pansey loamy sand and Ardilla loamy sand. Also included are a few small areas of soils that have a thick, black

surface layer; soils that lack a fine-textured layer within a depth of 80 inches; and soils that have sandy surface and subsurface layers with a combined thickness of less than 40 inches. Other inclusions are some areas of Plummer soils that have a surface layer of loamy fine sand.

This soil is poorly suited to cultivated crops and to pasture and hay grasses. If the soil has an effective water-control system, it is moderately suited to such cultivated crops as corn and soybeans and is suited to pasture and hay grasses such as bahiagrass.

A complete water-control system of ditches and laterals must be constructed and maintained if areas are cultivated. The hazard of erosion is slight, but a cropping rotation that includes close-growing, soil-improving crops is needed to maintain the organic-matter content. All crop residue should be returned to the soil. Pastures need drainage to remove excess surface water. Lime and fertilizer are needed in areas that are used for cultivated crops and pasture grasses.

Most areas are woodland. Capability unit IVw-1; woodland suitability group 2w3.

Stilson Series

The Stilson series consists of nearly level to gently sloping, moderately well drained soils that formed in thick beds of loamy marine deposits. These soils are on broad, low ridges between small streams and along drainageways.

In a representative profile the surface layer is dark grayish-brown loamy sand about 5 inches thick. The subsurface layer, about 20 inches thick, is light yellowish-brown loamy sand that has few, faint, very pale brown mottles. The subsoil extends to a depth of 68 inches. In sequence from the top, it is 4 inches of brownish-yellow sandy loam; 16 inches of brownish-yellow sandy clay loam that has yellowish-brown, light-gray, strong-brown, reddish-brown, and red mottles; and 23 inches of sandy clay loam mottled in shades of red, brown, yellow, gray, and white.

The available water capacity is low to a depth of about 25 inches and moderate below this depth. Permeability is rapid to a depth of about 25 inches and moderate below this depth. Natural fertility is low.

Representative profile of Stilson loamy sand, 1 to 3 percent slopes, 3.0 miles north of Gritney Crossroads and 0.51 mile east of State Highway 179 and 0.25 mile north of a good motor road in the NE¼SE¼ sec. 5, T. 5 N., R. 16 W.:

A1—0 to 5 inches, dark grayish-brown (10YR 4/2) loamy sand; weak, medium, granular structure; very friable; many fine roots; strongly acid; gradual, wavy boundary.

A2—5 to 25 inches, light yellowish-brown (10YR 6/4) loamy sand; few, fine, faint mottles of very pale brown; weak, medium, granular structure; very friable; common fine roots; strongly acid; clear, wavy boundary.

B1—25 to 29 inches, brownish-yellow (10YR 6/6) sandy loam; few, fine, faint mottles of pale brown and few, fine, distinct mottles of strong brown; weak, medium, subangular blocky structure; friable; few medium and fine roots; sand grains coated and bridged with clay; strongly acid; gradual, wavy boundary.

B21t—29 to 39 inches, brownish-yellow (10YR 6/6) sandy clay loam; few, fine, distinct mottles of strong brown and yellowish brown and few, fine, faint mottles of pale brown in lower part; weak, medium, subangular blocky structure; friable; thin discontinuous clay films on ped faces; strongly acid; gradual, wavy boundary.

B22t—39 to 45 inches, brownish-yellow (10YR 6/6) sandy clay loam; common, medium, distinct mottles of yellowish brown (10YR 5/8), light gray (10YR 7/2), strong brown (7.5YR 5/6), reddish brown (2.5YR 4/4), and red (10R 4/6); weak, medium, subangular blocky structure; friable; few fine roots; estimated 6 percent, by volume, is firm, brittle plinthite; thin discontinuous clay films on ped faces; strongly acid; gradual, wavy boundary.

B23t—45 to 68 inches, sandy clay loam; mottled yellowish brown (10YR 5/8), brownish yellow (10YR 6/8), strong brown (7.5YR 5/8), light reddish brown (5YR 6/3), weak red (2.5YR 5/2), red (10R 4/6), light gray (N 7/0), and white (N 8/0); moderate, medium, subangular blocky structure; firm; estimated 10 percent, by volume, is firm, brittle plinthite; thin discontinuous clay films on ped faces; strongly acid.

The A1 or Ap horizon is dark-gray, very dark gray, or dark grayish-brown loamy sand or sand. It ranges from 3 to 6 inches in thickness. The A2 horizon is dark grayish-brown, grayish-brown, pale-yellow, light yellowish-brown, or light olive-brown loamy sand or sand. It ranges from 18 to 32 inches in thickness.

The B1 horizon is brownish-yellow or light yellowish-brown sandy loam or sandy clay loam that is as much as 6 inches thick. The B2t horizon contains 19 to 35 percent clay and less than 20 percent silt. The B21t and B22t horizons are brownish-yellow, yellowish-brown, light yellowish-brown sandy clay loam or sandy loam. They range from 10 to 19 inches in combined thickness. They have mottles in shades of red, yellow, and brown. The B22t horizon also has few or common gray mottles at a depth of 30 to 40 inches. The B23t horizon is mottled in shades of red, yellow, brown, gray, and white. The B22t and B23t horizons contain 5 to 20 percent plinthite that begins at a depth of 32 to 48 inches and extends to a depth of 65 inches.

Reaction is strongly acid to very strongly acid throughout. The content of ironstone concretions ranges from 0 to 5 percent, by volume, in the A horizon and upper part of the B horizon. The water table is at a depth of 30 to 40 inches for 1 to 2 months in wet periods in most years.

Stilson soils are associated with Ardilla, Dothan, Fuquay, and Pantego soils. They have an A horizon that is more than 20 inches thick, whereas the A horizon of Ardilla soils is less than 20 inches thick. Stilson soils are more poorly drained than Dothan and Fuquay soils, but they are not so poorly drained as Pantego soils.

Stilson loamy sand, 1 to 3 percent slopes (StA).—This is a moderately well drained soil on broad low ridges between small streams and along drainageways. The water table is at a depth of 30 to 40 inches for 1 to 2 months during wet seasons in most years.

Included with this soil in mapping are a few small areas of Fuquay loamy sand, Leefield loamy sand, Albany sand, and Chipley sand. Also included are a few small areas of Ardilla loamy sand and Pansey loamy sand that are generally indicated on the detailed soil map by a wet-spot symbol. Other inclusions are some areas of Stilson soils that have a surface layer of sand.

Among the cultivated crops to which this soil is suited are corn, soybeans, peanuts, and watermelons. Among the pasture and hay grasses to which it is well suited are Coastal bermudagrass, bahiagrass, and small grain.

The hazard of excess water in the root zone is slight. A water-control system is needed that removes excess surface water in wet periods. The hazard of erosion is slight, but a crop sequence that includes regular use of close-growing, soil-improving crops is desirable to maintain the organic-matter content. All crop residue should be returned to the soil. Improved pastures are not seriously affected by soil wetness. Liming and frequent fertilizing are needed for both cultivated crops and pasture. Capability unit IIw-1; woodland suitability group 3s2.

Tifton Series

The Tifton series consists of gently sloping to sloping, well-drained soils that formed in loamy marine deposits. These soils are on broad ridges and short side slopes.

In a representative profile the surface layer is dark-gray loamy sand about 8 inches thick. The subsoil extends to a depth of 65 inches. In sequence from the top, it is 7 inches of brownish-yellow sandy loam; 19 inches of yellowish-brown sandy clay loam; 12 inches of brownish-yellow sandy clay loam that has few strong-brown and red mottles; and 19 inches of reticulately mottled yellowish-brown, brownish-yellow, very pale brown, strong-brown, yellowish-red, and red sandy clay loam. The surface layer and upper part of the subsoil have many, small to medium ironstone concretions.

The available water capacity is low to a depth of 8 inches and moderate below this depth. Permeability is rapid to a depth of 8 inches and moderate below this depth. Natural fertility is low.

Representative profile of Tifton loamy sand, 2 to 5 percent slopes, 0.25 mile south of Poplar Springs School on south side of a good motor road in the SE¼SW¼ sec. 6, T. 6 N., R. 13 W.:

Apcn—0 to 8 inches, dark-gray (10YR 4/1) loamy sand; weak, fine, granular structure; very friable; common, small and medium, strongly cemented ironstone concretions; common fine and medium roots; strongly acid; clear, smooth boundary.

B1tcn—8 to 15 inches, brownish-yellow (10YR 6/6) sandy loam; moderate, medium, granular structure; friable; common, fine and medium, strongly cemented ironstone concretions; few fine and medium roots; common fine pores; strongly acid; clear, wavy boundary.

B21tcn—15 to 34 inches, yellowish-brown (10YR 5/8) sandy clay loam; moderate, medium, subangular blocky structure; friable; few fine roots; few fine pores; common small ironstone concretions; thin discontinuous clay films on ped faces; strongly acid; gradual, wavy boundary.

B22t—34 to 46 inches, brownish-yellow (10YR 6/8) sandy clay loam; few, fine, distinct, strong-brown (7.5YR 5/8) and red (2.5YR 4/6) mottles; moderate, medium, subangular blocky structure; friable; few, small, hard ironstone concretions; estimated 3 percent, by volume, is firm plinthite; clay films on ped faces; strongly acid; gradual, wavy boundary.

B3t—46 to 65 inches, sandy clay loam; reticulately mottled yellowish brown (10YR 5/8), brownish yellow (10YR 6/6), very pale brown (10YR 7/4), strong brown (7.5YR 5/6), yellowish red (5YR 5/8), and red (2.5YR 4/6); moderate, medium, subangular blocky structure; firm; estimated 8 percent, by volume, is firm plinthite; clay films between ped faces; strongly acid.

The A1cn or Apcn horizon is grayish-brown, dark-gray, dark grayish-brown, or dark-brown loamy sand or sandy loam. It ranges from 4 to 10 inches in thickness. Some profiles have a well-defined A2 horizon of yellowish-brown or brown loamy sand or sandy loam that is 3 to 5 inches thick. The B1tcn, B21tcn, and B22t horizons are brownish-yellow, yellowish-brown, strong-brown, or yellowish-red sandy clay loam or sandy loam. The Bt horizon contains 18 to 35 percent clay and less than 20 percent silt. The B1tcn horizon ranges from 3 to 8 inches in thickness, but it is absent in a few places. The B22t horizon has few to common mottles in shades of red, brown, yellow, and gray. The B3t horizon is mottled in these same shades and is sandy clay loam or sandy loam. It contains 5 to 15 percent of firm plinthite. Reaction is strongly acid or very strongly acid throughout. Ironstone concretions range from 5 to 20 percent in the A and upper part of the B horizon. Depth to horizons containing plinthite ranges from 33 to 55 inches. The water table is at a depth of more than 72 inches.

Tifton soils are associated with Dothan, Gritney, and Fuquay soils. They have abundant, strongly cemented ironstone concretions on the surface and in the A horizon and upper part of the Bt horizon, but the Dothan, Gritney, and Fuquay soils do not. They have a loamy B horizon, whereas the Gritney soils have a clayey B horizon. They have an A horizon that is less than 20 inches thick, but Fuquay soils have an A horizon that is more than 20 inches thick.

Tifton loamy sand, 2 to 5 percent slopes (TfB).—This is a well-drained soil on broad ridges. The profile of this soil is the one described as representative of the series. The water table is at a depth of more than 72 inches.

Included with this soil in mapping are a few small areas of Dothan loamy sand, 2 to 5 percent slopes, Faceville sandy loam, 2 to 5 percent slopes, Gritney loamy sand, 2 to 5 percent slopes, and Fuquay loamy sand. Also included are some areas of Tifton soils that have a surface layer of sandy loam.

Among the cultivated crops to which this soil is suited are corn, soybeans, peanuts, and watermelons. Among the pasture and hay grasses to which it is well suited are Coastal bermudagrass, bahiagrass, and small grain.

Erosion is a hazard if this soil is cultivated (fig. 7). Erosion can best be controlled by contour cultivation, terraces, stabilized waterways, or stripcropping. These practices are more effective if they are used with a cropping sequence that includes regular use of high-residue crops, perennial grasses, or close-growing, soil-improving crops. All crop residue should be returned to the soil. Capability unit IIe-1; woodland suitability group 3o1.

Tifton loamy sand, 5 to 8 percent slopes (TfC).—This is a well-drained soil on short side slopes.

Included with this soil in mapping are a few small areas of Dothan loamy sand, 5 to 8 percent slopes, Gritney loamy sand, 5 to 8 percent slopes, and Faceville sandy loam, 5 to 8 percent slopes. Also included are a few small areas of soils that have plinthite at a depth of less than 24 inches and a few small areas of severely eroded soils. Other inclusions are some areas of Tifton soils that have a surface layer of sandy loam.

Among the cultivated crops to which this soil is moderately suited are corn, soybeans, watermelons, and peanuts. Among the pasture and hay grasses to which it is suited are Coastal bermudagrass, bahiagrass, and small grain.

The limitations to cultivated crops are severe because this soil is subject to severe erosion if it is cultivated. Erosion is best controlled by terraces, stabilized waterways, contour cultivation, and stripcropping. These practices are more effective if they are used with a cropping sequence that includes a rotation of close-growing crops, high-residue crops, and perennial grasses. All crop residue should be returned to the soil. Liming and regular use of fertilizers are needed. Capability unit IIIe-1; woodland suitability group 3o1.

Troup Series

The Troup series consists of nearly level to sloping, well-drained soils that formed in thick beds of sandy and loamy marine deposits. These soils are on broad ridges and long side slopes.

In a representative profile the surface layer is dark grayish-brown sand about 5 inches thick. The subsurface layer is sand about 40 inches thick. The upper 6 inches of this layer is pale brown, and the lower 34 inches is yellow-

***Figure 7.*—Field where rows have been placed on the contour to help control erosion. The soil is Tifton loamy sand, and the crop is grain sorghum.**

ish brown. The next layer is yellowish-red sand 13 inches thick. The subsoil begins at a depth of about 58 inches and extends to a depth of 83 inches. The upper 8 inches of the subsoil is red sandy loam that has few reddish-yellow streaks. Below this, the subsoil is red sandy clay loam that has few yellowish-brown mottles.

The available water capacity is low to a depth of 58 inches and moderate below this depth. Permeability is rapid to a depth of 58 inches and moderate below this depth. Natural fertility is low.

Representative profile of Troup sand, 1 to 8 percent slopes, 1 mile west of Winterville Church on State Highway No. 177A in the SE¼SW¼ sec. 1, T. 4 N., R 16 W.:

A1—0 to 5 inches, dark grayish-brown (10YR 4/2) sand; single grained; loose; many medium and fine roots; many clean sand grains; strongly acid; gradual, wavy boundary.

A21—5 to 11 inches, pale-brown (10YR 6/3) sand; single grained; loose; common medium and fine roots; many clean sand grains; strongly acid; gradual, wavy boundary.

A22—11 to 31 inches, yellowish-brown (10YR 5/4) sand; single grained; loose; few medium and fine roots; sand grains dominantly coated; very few small quartz pebbles; strongly acid; gradual, wavy boundary.

A23—31 to 45 inches, yellowish-brown (10YR 5/6) sand; few, fine, distinct streaks of pale brown (10YR 6/3); single grained; loose; few medium and fine roots; sand grains dominantly coated; strongly acid; gradual, wavy boundary.

A23&B1—45 to 58 inches, yellowish-red (5YR 5/8) sand; common, medium, distinct, red (2.5YR 4/8) nodules of loamy sand; weak, fine, granular structure; very friable; few medium and fine roots; strongly acid; gradual, wavy boundary.

B21t—58 to 66 inches, red (2.5YR 4/8) sandy loam; few, fine, distinct, horizontal streaks of reddish yellow (5YR 6/6); weak, medium, subangular blocky structure; very friable; sand grains coated and bridged with clay; strongly acid; gradual, wavy boundary.

B22t—66 to 83 inches, red (2.5YR 4/8) sandy clay loam; few, fine, distinct mottles of yellowish brown (10YR 5/8); weak, medium, subangular blocky structure; very friable; sand grains coated and bridged with clay; strongly acid.

The A1 or Ap horizon is very dark grayish brown, dark grayish brown, or grayish brown and ranges from 2 to 8 inches in thickness. The A2 horizon is yellowish brown, pale brown, or brown and ranges from 35 to 56 inches in thickness. The A23&B1 horizon is yellowish red, reddish yellow, or strong brown. It ranges from 6 to 18 inches in thickness. The Bt horizon is reddish-yellow, strong-brown, yellowish-red, or red sandy loam or sandy clay loam. Reaction is strongly acid or very strongly acid throughout. The water table is at a depth of more than 83 inches.

Troup soils are associated with Albany, Lakeland, Lucy, Fuquay, and Bonifay soils. They are better drained than Albany soils, and they have a Bt horizon that Lakeland soils do not have. They have a thicker A horizon than Lucy and Fuquay soils. Troup soils do not have plinthite that is characteristic of Bonifay soils.

Troup sand, 1 to 8 percent slopes (TrC).—This is a well-drained soil on broad ridges and long side slopes. The water table is at a depth of more than 83 inches.

Included with this soil in mapping are a few small areas of Lakeland sand, Lucy loamy sand, Bonifay sand, and Fuquay loamy sand. Also included are a few small areas of Albany sand and Ardilla loamy sand that are indicated on the soil map by a wet-spot symbol. Other inclusions are a few areas of slightly eroded to moderately eroded soils.

Among the cultivated crops to which this soil is moderately suited are corn, peanuts, soybeans, and watermelons. Among the pasture and hay grasses to which it is

suited are Coastal bermudagrass, bahiagrass, and small grain.

Droughtiness and rapid leaching are severe limitations to cultivated crops. Erosion is a hazard in the steeper areas. Among the practices needed for conserving soil are contour cultivation and a cropping sequence that includes a rotation of annual, close-growing crops; high-residue crops; and perennial grasses. All crop residue should be returned to the soil to improve the organic-matter content and available water capacity in the major root zone. Liming and regular use of fertilizers are needed. Alternate contour strips of perennial grass make the cropping sequence more effective and also aid in the control of erosion on the slopes. Capability unit IIIs-1; woodland suitability group 3s2.

Use and Management of the Soils for Cultivated Crops and Pasture

This section discusses the management of the soils for cultivated crops and pasture and explains the system of capability grouping used by the Soil Conservation Service. In addition, predicted yields of principal crops are given.

Most of the soils in Holmes County are suited to cultivated crops and are well suited to improved pasture and hay grasses.

Mainly well drained or moderately well drained soils that have a sandy surface layer and a loamy subsoil are used for cultivated crops and pasture. Soil erosion is a hazard on the sloping soils, and adequate erosion control measures are needed. Most soils are low in natural fertility and are strongly acid to very strongly acid. Liming and frequent applications of fertilizers are required for increased yields.

About 48,000 acres in the county are used for field crops (*4*). The principal field crops grown are corn, soybeans, peanuts, and small grain. Several thousand acres of watermelons are planted each year, and a small acreage is used for other vegetables, such as peas, beans, okra, and tomatoes. Sprinkler irrigation is used in some places on the better drained soils.

Cattle production is an important part of many farming operations. Almost 40,000 acres of improved pasture has been established throughout the county (*4*), and most improved pasture is used for beef cattle in cow-calf operations. Improved pasture and annual forage crops are also used by the 13 dairies now located in the county. Bahiagrass is the most widely used pasture grass. Coastal bermudagrass is also used for hay production and some grazing. Fescue and crimson clover are used only to a very limited extent for winter forage.

Capability Grouping

Capability grouping shows, in a general way, the suitability of soils for most kinds of field crops. The soils are grouped according to their limitations when used for field crops, the risk of damage when they are so used, and the way they respond to treatment. The grouping does not take into account major and generally expensive landforming that would change slope, depth, or other characteristics of the soils; does not take into consideration possible but unlikely major reclamation projects; and does not apply to rice, cranberries, horticultural crops, or other crops requiring special management.

Those familiar with the capability classification can infer from it much about the behavior of soils when used for other purposes, but this classification is not a substitute for interpretations designed to show suitability and limitations of groups of soils for range, for forest trees, or engineering.

In the capability system, the kinds of soils are grouped at three levels: the capability class, subclass, and unit. These are discussed in the following paragraphs.

CAPABILITY CLASSES, the broadest groups, are designated by Roman numerals I through VIII. The numerals indicate progressively greater limitations and narrower choices for practical use.

CAPABILITY SUBCLASSES are soil groups within one class; they are designated by adding a small letter, *e*, *w*, *s*, or *c* to the class numeral, for example, IIe. The letter *e* shows that the main limitation is risk of erosion unless close-growing plant cover is maintained; *w* shows that water in or on the soil interferes with plant growth or cultivation (in some soils the wetness can be partly corrected by artificial drainage); *s* shows that the soil is limited mainly because it is shallow, droughty, or stony; and *c*, used in only some parts of the United States, shows that the chief limitation is climate that is too cold to too dry.

In class I there are no subclasses, because the soils of this class have few limitations. Class V can contain, at the most, only the subclasses indicated by *w*, *s*, and *c*, because the soils in class V are subject to little or no erosion, though they have other limitations that restrict their use largely to pasture, range, woodland, wildlife, or recreation.

CAPABILITY UNITS are soil groups within the subclasses. The soils in one capability unit are enough alike to be suited to the same crops and pasture plants, to require similar management, and to have similar productivity and other responses to management. Thus, the capability unit is a convenient grouping for making many statements about management of soils. Capability units are generally designated by adding an Arabic numeral to the subclass symbol, for example, IIe-4 or IIIe-6. Thus, in one symbol, the Roman numeral designates the capability class, or degree of limitation; the small letter indicates the subclass, or kind of limitation, as defined in the foregoing paragraph; and the Arabic numeral specifically identifies the capability unit within each subclass.

The eight classes in the capability system and the subclasses and units in Holmes County are described in the list that follows. The capability unit designation for each soil is given in the "Guide to Mapping Units" at the back of this survey.

Class I soils have few limitations that restrict their use. (None in Holmes County.)

Class II soils have moderate limitations that reduce the choice of plants or require moderate conservation practices.

Subclass IIe.—Soils that are subject to moderate erosion if they are not protected.

Unit IIe-1.—Gently sloping, well-drained soils that have a thin sandy layer or layers over a loamy subsoil.

Unit IIe-2.—Gently sloping, well-drained soils that have a thin, loamy surface layer over a clayey subsoil.

Subclass IIw.—Soils that have moderate limitations because of excess water.

Unit IIw-1.—Nearly level to gently sloping, moderately well drained soils that have a thick, sandy surface layer over a loamy subsoil.

Unit IIw-2.—Nearly level to gently sloping, somewhat poorly drained soils that have a thick, sandy surface layer over a loamy subsoil.

Unit IIw-3.—Nearly level, somewhat poorly drained soils that have thin, sandy surface layer over a loamy subsoil.

Subclass IIs.—Soils that have moderate limitations because of droughtiness or moderately slow permeability.

Unit IIs-1.—Nearly level, well-drained soils that have a thin, sandy surface layer over a loamy subsoil.

Unit IIs-2.—Nearly level to sloping, well-drained soils that have a thick, sandy surface layer over a loamy subsoil.

Class III soils have severe limitations that reduce the choice of plants, require special conservation practices, or both.

Subclass IIIe.—Soils that are subject to severe erosion if they are cultivated and not protected.

Unit IIIe-1.—Sloping, well-drained soils that have a thin, sandy layer or layers over a loamy subsoil.

Unit IIIe-2.—Sloping, well-drained soils that have a thin, loamy surface layer over a clayey subsoil.

Unit IIIe-3.—Gently sloping, moderately well drained and well drained soils that have a thin, loamy or sandy surface layer over a clayey or loamy subsoil.

Unit IIIe-4.—Gently sloping, somewhat poorly drained soils that have an extremely thick, sandy surface layer over a loamy subsoil.

Subclass IIIs.—Soils that have severe limitations because of droughtiness.

Unit IIIs-1.—Nearly level to sloping, well-drained soils that have an extremely thick, sandy surface layer over a loamy subsoil.

Unit IIIs-2.—Nearly level to gently sloping, moderately well drained soils that are sandy throughout.

Class IV soils have very severe limitations that reduce the choice of plants, require very careful management, or both.

Subclass IVe.—Soils that are subject to very severe erosion if they are cultivated and not protected.

Unit IVe-1.—Sloping, well-drained soils that have a thin, sandy surface layer over a clayey subsoil.

Subclass IVw.—Soils that have very severe limitations because of excess water.

Unit IVw-1.—Nearly level, poorly drained soils that have an extremely thick, sandy surface layer over a loamy subsoil.

Unit IVw-2.—Nearly level, poorly drained soils that have a moderately thick, sandy surface layer over a loamy subsoil.

Subclass IVs.—Soils that have very severe limitations because of droughtiness.

Unit IVs-1.—Nearly level to gently sloping, excessively drained soils that are sandy throughout.

Class V soils are not likely to erode, but have other limitations, impractical to remove without major reclamation, that limit their use largely to pasture, woodland, or wildlife.

Subclass Vw.—Soils that are too wet for cultivation; drainage or protection not feasible.

Unit Vw-1.—Association of nearly level, poorly drained soils that are loamy throughout, that are subject to periodic stream overflow, and that have a fluctuating high water table.

Unit Vw-2.—Complex of nearly level, very poorly drained soils that have a moderately thick, sandy surface layer over a loamy subsoil, that are subject to ponding with shallow water, and that have a fluctuating high water table.

Class VI soils have severe limitations that make them generally unsuited to cultivation and that limit their use largely to pasture, woodland, or wildlife.

Subclass VIe.—Soils that are severely limited, chiefly by risk of erosion, if protective cover is not maintained.

Unit VIe-1.—Complex of sloping and strongly sloping, well-drained soils that have a thin, sandy surface layer over a loamy subsoil.

Class VII soils have very severe limitations that make them unsuited to cultivation and that restrict their use largely to pasture or range, woodland, or wildlife habitat. (None in Holmes County.)

Class VIII soils and landforms have limitations that preclude their use for commercial plants and restrict their use to recreation, wildlife, water supply, or to esthetic purposes. (None in Holmes County.)

Predicted Yields

Table 2 lists predicted yields of the principal crops and pasture plants grown in Holmes County. The predictions are based on estimates made by farmers, soil scientists, and others who have knowledge of yields in the county and on information taken from research data. Crops other than those shown in table 2 are grown in the county, but their predicted yields are not included, because their acreage is small or because reliable data on yields are not available.

The predicted average yields per acre given in table 2 can be expected under a high level of management. A high level of management includes the following practices in areas that are not irrigated:

1. Rainfall is effectively used and conserved.
2. Surface and subsurface drainage systems or both are installed.
3. Crop residues are managed to maintain soil tilth.
4. Minimum but timely tillage is used.
5. Insect, disease, and weed control measures are consistently used.

6. Fertilizer is applied according to soil test and crop needs.
7. Adapted crop varieties are used at recommended seeding rates.
8. Needed conservation practices are installed and maintained.

A high level of management in irrigated areas includes the following additional practices:

1. Suitable quality and quantity or irrigation water is used.
2. Irrigations are timed to meet the need of the soil and crop.
3. Irrigation systems are properly designed and efficiently used.

Use of the Soils for Woodland

Originally, Holmes County was mainly wooded. Now, trees cover about 65 percent of the county. Good stands of commercial trees are produced in the woodlands of the county. Pine forests are most commonly on the hills, and hardwoods generally are dominant on the bottoms along rivers and creeks. Forests of planted pine are common in the county.

The commercial value of the wood products is substantial, though it is below its potential. Other values of woodland include grazing, wildlife, recreation, natural beauty, and conservation of soil and water.

In table 3 the soils of Holmes County have been placed in woodland suitability groups to assist owners in planning the proper use of their soils for wood crops. Each group is made up of soils that are suited to the same kinds of trees, that need approximately the same kind of management when the vegetation on them is similar, and that have about the same potential productivity. A brief description is given in the table for each group, management hazards and limitations that are based on soils are given, and some of the preferred timber species and their average site indexes are shown.

Each woodland group is identified by a three-part symbol, such as 2o1, 2w9, or 3s2. The first part of the symbol, an Arabic numeral, indicates relative potential productivity of the soils in the group: 1, very high; 2, high; 3, moder-

TABLE 2.—*Predicted average yields per acre of principal crops under a high level of management*

[Absence of a yield figure indicates that the soil is not suited to the crop, the crop is not commonly grown on the soil, or data are not available]

Soil	Corn	Peanuts	Soybeans	Watermelons	Coastal bermudagrass (hay)	Improved pasture grasses: Coastal bermudagrass	Improved pasture grasses: Pensacola bahiagrass
	Bushels	*Pounds*	*Bushels*	*Pounds*	*Tons*	*Animal-unit-months* [1]	*Animal-unit-months* [1]
Albany sand	60		25	10,000	4.5	7.3	6.8
Angie fine sandy loam	65		30	12,000	6.0	7.0	7.0
Ardilla loamy sand	75		35	10,000	5.5	8.0	7.0
Bibb association							
Bonifay sand, 1 to 8 percent slopes	45	1,400	20	10,000	4.0	6.5	6.5
Chipley sand	50		25	10,000	5.5	8.0	7.5
Dothan loamy sand, 0 to 2 percent slopes	80	2,100	40	12,000	5.5	9.0	8.0
Dothan loamy sand, 2 to 5 percent slopes	70	2,050	40	10,000	5.5	9.0	8.0
Dothan loamy sand, 5 to 8 percent slopes	60	1,700	30	9,000	5.0	8.0	7.0
Dothan complex					3.0	5.0	5.0
Faceville sandy loam, 2 to 5 percent slopes	75	2,100	30	11,000	6.0	9.5	8.0
Faceville sandy loam, 5 to 8 percent slopes	65	1,000	25	8,000	5.5	9.0	7.0
Fuquay loamy sand, 1 to 8 percent slopes	75	2,500	35	11,000	5.0	7.0	7.0
Gritney loamy sand, 2 to 5 percent slopes	45	1,100	25	7,000	4.5	6.0	6.0
Gritney loamy sand, 5 to 8 percent slopes	35	1,000	25		4.0	5.0	5.0
Kenansville fine sand	60	1,900	30	10,000	4.5	7.0	7.0
Lakeland sand	45	1,000	20	10,000	3.5	5.0	5.0
Leefield loamy sand	65		25	10,000	5.5	8.0	7.5
Lucy loamy sand, 1 to 8 percent slopes	70	2,200	35	11,000	5.0	7.5	7.5
Maxton loamy fine sand	75	2,400	35	11,000	5.0	8.5	7.5
Orangeburg loamy sand, 2 to 5 percent slopes	80	2,500	40	12,000	5.5	9.0	8.0
Orangeburg loamy sand, 5 to 8 percent slopes	75	2,300	30	9,000	5.0	8.0	7.0
Pansey loamy sand	70		30				6.0
Pantego complex							
Plummer fine sand	70		30				6.0
Stilson loamy sand, 1 to 3 percent slopes	70	2,100	35	10,000	6.0	9.0	8.0
Tifton loamy sand, 2 to 5 percent slopes	80	2,500	35	10,000	6.0	9.5	8.0
Tifton loamy sand, 5 to 8 percent slopes	75	2,300	30	9,000	5.5	9.0	8.0
Troup sand, 1 to 8 percent slopes	55	1,800	25	10,000	3.5	6.5	6.5

[1] Animal-unit-months is the number of months during a normal grazing season that 1 acre will provide grazing for 1 animal unit (one cow, steer, or horse; five hogs; or seven sheep or goats) without injury to the pasture.

ately high; 4, moderate; and 5, low. These ratings are based on field determinations of average site index. Site index is the height, in feet, that the dominant trees of a given species, on a specified kind of soil, reach in a natural, unmanaged stand in a stated number of years. For the merchantable hardwoods and softwoods in this county, the site index is the height reached in 50 years, except for cottonwood, for which the site index is for height reached in 30 years.

The five foregoing ratings are based on field determination of average site index of an indicator forest type or species. Site indexes are grouped into site quality classes, and the classes are used to arrive at approximate expected yields per acre in cords and board feet. On basis of research studies, site index can be converted into approximate expected growth and yield per acre in cords and board feet. In table 3, the average annual growth in cords per acre is given for the pine species, but data are not available for hardwood species.

The second part of the symbol identifying a woodland suitability group is a lowercase letter. This letter indicates an important soil property that imposes a slight to severe hazard or limitation in managing the soils of the group for wood crops. The letter *o* shows that the soils have few limitations that restrict their use for trees; *s* shows that the soils are sandy and dry, have little or no difference in texture between surface layer and subsoil (or B horizon), have low available water capacity, and generally have a low supply of plant nutrients; and *w* shows that water in or on the soil, either seasonally or year round, is the chief limitation.

The third part of the symbol is an Arabic numeral that indicates degree of hazard or limitation and general suitability of the soils for certain kinds of trees.

The numeral 1 indicates soils that have no or only slight limitations and that are best suited to needleleaf trees.

The numeral 2 indicates soils that have one or more moderate limitations and that are best suited to needleleaf trees.

The numeral 3 indicates soils that have one or more severe limitations and that are best suited to needleleaf trees.

The numeral 4 indicates soils that have no or only slight limitations and that are best suited to broadleaf trees.

The numeral 5 indicates the soils that have one or more moderate limitations and that are best suited to broadleaf trees.

The numeral 6 indicates soils that have one or more severe limitations and that are best suited to broadleaf trees.

The numeral 7 indicates soils that have no or only slight limitations and that are suited to either needleleaf or broadleaf trees.

The numeral 8 indicates soils that have one or more moderate limitations and that are suited to either needleleaf or broadleaf trees.

The numeral 9 indicates soils that have one or more severe limitations and that are suited to either needleleaf or broadleaf trees.

The numeral 0 indicates that the soils are not suitable for producing commercial timber.

The hazards or limitations that affect the management of soils for woodland are erosion hazard, equipment limitations, seedling mortality, and plant competition. In table 3, each woodland suitability group is rated for these hazards and limitations. The ratings are explained in the following paragraphs.

Erosion hazard refers to the potential hazard of soil loss in well-managed woodland. The hazard is *slight* if expected soil loss is small; *moderate* if some soil loss is expected and care is needed during logging and construction to reduce soil loss; and *severe* if special methods of operation are necessary for preventing excessive soil loss. In Holmes County, none of the soils are subject to severe erosion.

Equipment limitations are rated on the basis of soil characteristics that restrict or prohibit the use of equipment commonly used in tending and harvesting the trees. In Holmes County, soil characteristics having the most limiting effect are drainage, depth to the water table, slope, and texture of the surface layer. *Slight* means there is no restriction in the kind of equipment or in the time of year it is used; *moderate* means that use of equipment is restricted for less than 3 months of the year; and *severe* means that special equipment is needed and its use is restricted for more than 3 months of the year.

Seedling mortality refers to the expected degree of mortality of planted seedlings as influenced by kinds of soil when plant competition is not a limiting factor. Considered in the ratings are depth to the water table, hazard of flooding, drainage, soil depth and structure, and degree of erosion. Normal rainfall, good planting stock, and proper planting are assumed. A rating of *slight* indicates an expected loss of less than 25 percent of the planted seedlings; *moderate*, a loss of 25 to 50 percent of the seedlings; and *severe*, a loss of more than 50 percent of the seedlings. Special preparation of the site is needed before planting on soils where the rating is severe and on most of the soils where the rating is moderate.

Plant competition is rated on the basis of the degree to which unwanted plants invade openings in the tree canopy. Considered in the ratings are available moisture capacity, fertility, drainage, and degree of erosion. A rating of *slight* means that competition from other plants is not a problem; *moderate*, that plant competition delays development of fully stocked stands of desirable trees; and *severe*, that plant competition prevents establishment of a desirable stand unless intensive site preparation and such practices as weeding are used to control undesirable plants.

Use of the Soils for Wildlife

Soils directly influence the kind and amount of vegetation and the amount of water available, and in this way they indirectly influence the kinds of wildlife that can live in an area. Soil properties that affect the growth of wildlife habitat are thickness of soil useful to crops, texture of the surface layer, available water capacity to a depth of 40 inches, wetness, surface stoniness or rockiness, flood hazard, slope, and permeability of the soil to air and water.

In table 4 the soils in this survey area are rated for producing seven elements of wildlife habitat and for three groups, or kinds, of wildlife. The ratings indicate relative

TABLE 3.—*Soil ratings for woodland use*

[Absence of yield figure indicates

Woodland group and map symbols	Potential soil productivity		
	Important trees	Site index [1]	Average annual growth [2]
			Cords per acre
Group 2o1: Well-drained, nearly level to sloping soils that have a thin or moderately thick sandy layer over a loamy subsoil; high potential productivity; suited to needleleaf trees. DoA, DoB, DoC, OrB, OrC.	Slash pine Loblolly pine Shortleaf pine Longleaf pine	90 90 70 70	2. 2 2. 3 1. 5 1. 0
Group 2o7: Well-drained, gently sloping soils that have a thin sandy layer over a loamy subsoil; high potential productivity; suited to needleleaf trees, broadleaf trees, or both. Md.	Slash pine Longleaf pine Loblolly pine Sweetgum Yellow-poplar	90 70 90 90 100	2. 2 1. 0 2. 3
Group 2w2: Somewhat poorly drained, nearly level soils that have a thin sandy layer over a loamy subsoil and moderately well-drained, nearly level to gently sloping soils that are sandy throughout; high potential productivity; suited to needleleaf trees. Ar, Ch.	Loblolly pine Slash pine Longleaf pine	90 90 75	2. 2 2. 3 1. 1
Group 2w3: Poorly drained, nearly level soils that have an extremely thick sandy layer over a loamy subsoil; high potential productivity; suited to needleaf trees. Pm.	Loblolly pine Slash pine Longleaf pine	90 90 60	2. 2 2. 2 . 7
Group 2w8: Moderately well drained, gently sloping soils that have a thin, loamy layer over a clayey subsoil; high potential productivity; suited to needleleaf trees, broadleaf trees, or both. An.	Slash pine Loblolly pine Longleaf pine Sweetgum Yellow-poplar	90 90 65 90 90	2. 2 2. 2 . 9
Group 2w9: Poorly drained, nearly level soils that are loamy throughout and very poorly drained, nearly level soils that have a moderately thick sandy layer over a loamy subsoil; high potential productivity; suited to needleleaf trees, broadleaf trees, or both. Bb, Pg.	Loblolly pine Slash pine Sweetgum	90 90 90	2. 3 2. 2
Group 3o1: Well-drained, gently sloping and sloping soils that have a thin loamy layer over a clayey subsoil, or a thin sandy layer over a clayey or loamy subsoil; moderately high potential productivity; suited to needleleaf trees. FcB, FcC, GrB, GrC, TfB, TfC.	Slash pine Loblolly pine Longleaf pine	80 80 65	1. 8 1. 9 . 9
Group 3w2: Somewhat poorly drained, nearly level to gently sloping soils that have an extremely thick or thick sandy layer over a loamy subsoil; moderately high potential productivity; suited to needleleaf trees. Ab, Le.	Slash pine Loblolly pine Longleaf pine	80 80 70	2. 3 2. 3 1. 1
Group 3w9: Poorly drained, nearly level soils that have a thick sandy layer over a loamy subsoil; moderately high potential productivity; suited to needleleaf trees, broadleaf trees, or both. Pa.	Slash pine Longleaf pine	80 80	2. 2 2. 2
Group 3s2: Well drained and moderately well drained, nearly level to sloping soils that have an extremely thick or thick sandy layer over a loamy subsoil well drained, strongly sloping soils that have a thin sandy layer over a loamy subsoil; and excessively drained, nearly level to gently sloping soils that are sandy throughout; moderately high potential productivity; suited to needleleaf trees. BoC, Dt, FuC, Ke, Ld, LuC, StA, TrC.	Slash pine Loblolly pine Longleaf pine Shortleaf pine	80 80 70 70	2. 3 2. 2 1. 0 1. 5

[1] Based on the average height of dominant and codominant trees at an age of 50 years.

according to woodland suitability groups

that data are not available]

Management hazard or limitation				Species suitability	
Erosion hazard	Equipment limitations	Seedling mortality	Plant competition	Favor in existing stands	Use for planting
Slight	Slight	Slight	Slight	Slash pine, longleaf pine.	Slash pine, loblolly pine, longleaf pine.
Slight	Slight	Slight	Slight	Slash pine, longleaf pine.	Slash pine, yellow-poplar, sweetgum.
Slight	Moderate	Slight	Moderate	Slash pine	Slash pine.
Slight	Severe	Severe	Severe	Slash pine	Slash pine.
Slight	Moderate	Slight to moderate	Moderate	Slash pine	Slash pine, yellow-poplar, sweetgum.
Slight	Severe	Severe	Severe	Slash pine, sweetgum.	Slash pine, loblolly pine, sweetgum, water tupelo, sycamore.
Slight	Slight	Slight	Slight	Slash pine, loblolly pine.	Slash pine, loblolly pine.
Slight	Moderate	Moderate	Moderate	Slash pine	Slash pine.
Slight	Severe	Severe	Severe	Slash pine	Slash pine, loblolly pine.
Slight	Moderate	Moderate	Slight	Slash pine, longleaf pine.	Slash pine.

[2] Well-stocked, even-aged, managed stands to age 30 (a standard cord is 128 cubic feet).

suitability for various habitat elements and are expressed by an adjective rating as follows:

Good means habitats are easily improved, maintained, or created. There are few or no soil limitations in habitat management, and satisfactory results can be expected.

Fair means habitats can be improved, maintained, or created on these soils, but moderate soil limitations affect habitat management or development. A moderate intensity of management and fairly frequent attention may be required to ensure satisfactory results.

Poor means habitats can be improved, maintained, or created on these soils, but the soil limitations are severe. Habitat management may be difficult and expensive and require intensive effort. Results are questionable.

Very poor means that under the prevailing soil conditions, it is impractical to attempt to improve, maintain, or create habitats. Unsatisfactory results are probable.

The elements of wildlife habitat and kinds of wildlife in table 4 are explained in the following paragraphs.

Habitat Elements.—Each soil is rated in the table according to its suitability for producing various kinds of plants and other elements that make up wildlife habitats. The ratings take into account mainly the characteristics of the soils and closely related natural factors of the environment. They do not take into account climate, present use of soils, or present distribution of wildlife and people. For this reason, selection of a site for development as a habitat for wildlife requires inspection at the site.

Grain and seed crops are domestic grain or other seed-producing annuals planted to produce wildlife food. Examples are corn, sorghum, wheat, oats, barley, millet, buckwheat, cowpeas, soybeans, and sunflowers.

Domestic grasses and legumes are domestic grasses and legumes that are established by planting. They provide food and cover for wildlife. Grasses include bahiagrass, ryegrass, and panicgrass; legumes include annual lespedeza, shrub lespedeza, and other clovers.

Wild herbaceous plants are native or introduced perennial grasses, forbs, and weeds that provide food and cover for upland wildlife. Beggarweed, perennial lespedeza, wild bean, pokeweed, and cheatgrass are typical examples. On range, typical plants are bluestem, grama, perennial forbs, and legumes.

Hardwood trees are nonconiferous trees and associated woody understory plants that provide wildlife cover or produce nuts, buds, catkins, twigs, bark, or foliage used as food by wildlife. Such plants commonly grow in their natural environment, but they may be planted and developed through wildlife management programs. Typical plants in this category are oak, beech, cherry, dogwood, maple, viburnum, grape, honeysuckle, greenbrier, and silverberry.

Coniferous plants are cone-bearing trees that provide cover and frequently furnish food in the form of browse, seeds, or fruitlike cones. They commonly grow in their natural environment, but they may be planted and managed. Typical plants in this category are pines, cedars, and ornamental trees.

Wetland plants are annual and perennial herbaceous plants that grow wild on moist and wet sites. They furnish food and cover mostly for wetland wildlife. Typical examples of these plants are smartweed, wild millet, spikerush and other rushes, sedges, burreed, tearthumb, and aneilema. Submerged and floating aquatics are not included in this category.

Shallow water areas are areas of surface water with an average depth of less than 5 feet that are useful to wildlife. They include natural wet areas or those created by dams or levees or by water-control devices in marshes or streams. Examples are muskrat marshes, waterfowl feeding areas, wildlife watering developments, wildlife ponds, and beaver ponds.

Kinds of Wildlife.—Table 4 rates soils according to their suitability as habitat for the three kinds of wildlife in the county: openland, woodland, and wetland wildlife. These ratings are related to ratings made for the elements of habitat. For example, soils rated very poor for shallow water developments are rated very poor for wetland wildlife.

Openland wildlife are birds and mammals that normally live in meadows, pastures, and open areas where grasses, herbs, and shrubby plants grow. Bobwhite quail, dove, meadowlark, field sparrow, cottontail rabbit, and red fox are typical examples of openland wildlife.

Woodland wildlife are birds and mammals that normally live in wooded areas of either hardwood or coniferous trees and shrubs or a mixture of both. Woodpeckers, thrushes, wild turkey, vireos, deer, squirrel, and racoon are typical examples of woodland wildlife.

Wetland wildlife are birds and mammals that normally live in swampy, marshy, or open-water areas. Ducks, geese, rails, shore birds, herons, mink, muskrat, and beaver are typical examples of wetland wildlife.

Engineering Uses of the Soils [2]

This section is useful to those who need information about soils used as structural material or as foundation upon which structures are built. Among those who can benefit from this section are planning commissions, town and city managers, land developers, engineers, contractors, and farmers.

Among properties of soils highly important in engineering are permeability, strength, compaction characteristics, soil drainage, shrink-swell potential, grain size, plasticity, and soil reaction. Also important are depth to the water table, depth to bedrock, and slope. These properties, in various degrees and combinations, affect construction and maintenance of roads, airports, pipelines, foundations for small buildings, irrigation systems, ponds and small dams, and systems for disposal of sewage and refuse.

Information in this section of the soil survey can be helpful to those who—

1. Select potential residential, industrial, commercial, and recreational areas.
2. Evaluate alternate routes for roads, highways, pipelines, and underground cables.
3. Seek sources of topsoil, sand, or road fill.
4. Plan farm drainage systems, irrigation systems, ponds, terraces, and other structures for controlling water and conserving soil.
5. Correlate performance of structures already built with properties of the kinds of soil on which they

[2] JAMES N. KRIDER, Assistant State Conservation Engineer, Soil Conservation Service, helped prepare this section.

are built, for the purpose of predicting performance of structures on the same or similar kinds of soil in other locations.
6. Predict the trafficability of soils for cross-country movement of vehicles and construction equipment.
7. Develop preliminary estimates pertinent to construction in a particular area.

Most of the information in this section is presented in tables 5, 6, 7, and 8. Table 5 shows several estimated soil properties significant to engineering; table 6 shows results of engineering laboratory tests on soil samples; table 7 gives interpretations for various engineering uses; and table 8 gives the degree and kinds of limitations for recreational and other specified uses.

This information, along with the soil map and other parts of this publication, can be used to make interpretations in addition to those given in tables 7 and 8, and it also can be used to make other useful maps.

This information, however, does not eliminate need for further investigations at sites selected for engineering works, especially works that involve heavy loads or that require excavations to depths greater than those shown in the tables, generally depths greater than 6 feet. Also, inspection of sites, especially the small ones, is needed because many delineated areas of a given soil mapping unit may contain small areas of other kinds of soil that have strongly contrasting properties and different suitabilities or limitations for soil engineering.

Engineering Classification Systems

The two systems most commonly used in classifying samples of soils for engineering are the Unified Soil Classification System (*11*) used by the Soil Conservation Service engineers, Department of Defense, and others, and the AASHO Classification System (*1*) adopted by the American Association of State Highway Officials.

In the Unified Soil Classification System, soils are classified according to the particle-size distribution, plasticity, liquid limit, and organic matter. Soils are grouped in 15 classes. There are eight classes of coarse-grained soils, identified as GW, GP, GM, GC, SW, SP, SM, and SC; six classes of fine-grained soils, identified as ML, CL, OL, MH, CH, and OH; and one class of highly organic soils, identified as Pt. Soils possessing characteristics of two groups are designated by a combination of class symbols, for example, SM–SC.

The AASHO Classification System is used to classify soils according to those properties that affect use in highway construction and maintenance. In this system, a soil is placed in one of seven basic groups ranging from A–1 through A–7 on the basis of grain-size distribution, liquid limit, and plasticity index. In group A–1 are gravelly soils of high bearing capacity, or the best soils for subgrade (foundation). At the other extreme, in group A–7, are clay soils that have low strength when wet and that are the poorest soils for subgrade. Where laboratory data are available to justify a further breakdown, the A–1, A–2, and A–7 groups are divided as follows: A–1–a, A–1–b, A–2–4, A–2–5, A–2–6, A–2–7, A–7–5, and A–7–6. As an additional refinement, the engineering value of a soil material can be indicated by a group index number. Group indexes range from 0 for the best material to 20 or more for the poorest. The AASHO classification for tested soils, with group index numbers in parentheses, is shown in table 6; the estimated classification, without group index numbers, is given in table 5 for all soils mapped in the survey area.

Soil Properties Significant to Engineering

Several estimated soil properties significant in engineering are given in table 5. These estimates are made for typical soil profiles, by layers sufficiently different to have different significance for soil engineering. The estimates are based on field observations made in the course of mapping, on test data for these and similar soils, and on experience with the same kinds of soil in other counties. Following are explanations of some of the columns in table 5.

Soil texture is expressed in table 5 in the standard terms used by the Department of Agriculture. These terms take into account relative percentages of sand, silt, and clay in soil material that is less than 2 millimeters in diameter. "Sandy clay loam," for example, is soil material that contains 20 to 35 percent clay, less than 28 percent silt, and 45 percent or more sand. "Sand," "silt," "clay," and some of the other terms used in USDA textural classification are defined in the Glossary of this soil survey. The Unified Soil Classification System and the AASHO Classification System are described under Engineering Classification Systems.

Liquid limit and plasticity index indicate the effect of water on the strength and consistence of soil material. As the moisture content of a clayey soil is increased from a dry state, the material changes from a semisolid to a plastic state. If the moisture content is further increased, the material changes from a plastic to a liquid state. The plastic limit is the moisture content at which the soil material changes from the semisolid to plastic state; and the liquid limit, from a plastic to a liquid state. The plasticity index is the numerical difference between the liquid limit and the plastic limit. It indicates the range of moisture content within which a soil material is plastic. Liquid limit and plasticity index are estimated in table 5, but in table 6 the data on liquid limit and plasticity index are based on tests of soil samples.

Permeability is that quality of a soil that enables it to transmit water or air. It is estimated on basis of those soil characteristics observed in the field, particularly structure and texture. The estimates in table 5 do not take into account lateral seepage or such transient soil features as plowpans and surface crusts.

Available water capacity is the ability of soils to hold water for use by most plants. It is commonly defined as the difference between the amount of water in the soil at field moisture capacity and the amount at the wilting point of most crop plants.

Shrink-swell potential is the relative change in volume to be expected of soil material with changes in moisture content, that is, the extent to which the soil shrinks as it dries out or swells when it gets wet. Extent of shrinking and swelling is influenced by the amount and kind of clay in the soil. Shrinking and swelling of soils causes much damage to building foundations, roads, and other structures. A high shrink-swell potential indicates a hazard to maintenance of structures built in, on, or with material having this rating.

TABLE 4.—*Suitability of soils for elements*

Soil series and map symbols	Elements of wildlife habitat			
	Grain and seed crops	Domestic grasses and legumes	Wild herbaceous plants	Hardwood trees
Albany: Ab	Poor	Poor	Poor	Fair
Angie: An	Good	Good	Good	Good
Ardilla: Ar	Fair	Good	Good	Good
Bibb: Bb	Very poor	Poor	Poor	Good
Bonifay: BoC	Poor	Poor	Fair	Poor
Chipley: Ch	Poor	Poor	Poor	Poor
Dothan:				
DoA, DoB	Good	Good	Good	Good
DoC	Fair	Good	Good	Good
Dt	Poor	Fair	Fair	Fair
Faceville: FcB, FcC	Good	Good	Good	Fair
Fuquay: FuC	Fair	Fair	Good	Poor
Gritney: GrB, GrC	Fair	Fair	Good	Fair
Kenansville: Ke	Fair	Fair	Fair	Poor
Lakeland: Ld	Poor	Poor	Poor	Poor
Leefield: Le	Fair	Fair	Good	Fair
Lucy: LuC	Fair	Good	Good	Poor
Maxton: Md	Good	Good	Good	Good
Orangeburg: OrB, OrC	Good	Good	Good	Good
Pansey: Pa	Poor	Fair	Fair	Fair
Pantego: Pg	Very poor	Poor	Poor	Good
Plummer: Pm	Poor	Fair	Fair	Fair
Stilson: StA	Good	Good	Good	Fair
Tifton: TfB, TfC	Good	Good	Good	Fair
Troup: TrC	Poor	Fair	Fair	Poor

TABLE 5.—*Estimated soil properties*

Soil series and map symbols	Depth to seasonal high water table [1]	Depth from surface	Classification		
			USDA soil texture	Unified	AASHO
	In	*In*			
Albany: Ab	15–30	0–45	Sand, loamy sand	SM, SP–SM	A–2–4
		45–52	Sandy loam, sandy clay loam	SC	A–4, A–6
		52–65	Sandy clay loam, sandy loam	SC	A–4, A–6
Angie: An	30–60	0–6	Fine sandy loam	SM	A–2–4, A–4
		6–69	Clay loam	CL, CH	A–6, A–7
		69–75	Loam	CL	A–6
Ardilla: Ar	15–20	0–9	Loamy sand	SM	A–2–4
		9–16	Sandy loam	SC–SM, SC	A–2–4
		16–36	Sandy clay loam	SC	A–6, A–2
		36–65	Sandy clay loam, sandy clay	SC	A–2, A–6, A–7

See footnotes at end of table.

of wildlife habitat and kinds of wildlife

Elements of wildlife habitat—Continued			Kinds of wildlife		
Coniferous plants	Wetland plants	Shallow water areas	Openland	Woodland	Wetland
Fair	Poor	Very poor	Poor	Fair	Very poor.
Good	Poor	Very poor	Good	Good	Very poor.
Good	Fair	Fair	Good	Good	Fair.
Good	Good	Good	Poor	Good	Good.
Fair	Very poor	Very poor	Poor	Poor	Very poor.
Good	Poor	Poor	Poor	Fair	Poor.
Good	Poor	Very poor	Good	Good	Very poor.
Good	Poor	Very poor	Good	Good	Very poor.
Fair	Very poor	Very poor	Fair	Fair	Very poor.
Fair	Poor	Very poor	Good	Fair	Very poor.
Fair	Poor	Very poor	Fair	Fair	Very poor.
Fair	Poor	Very poor	Fair	Fair	Very poor.
Fair	Poor	Very poor	Fair	Fair	Very poor.
Fair	Very poor	Very poor	Poor	Fair	Very poor.
Fair	Fair	Fair	Fair	Fair	Fair.
Fair	Very poor	Very poor	Good	Fair	Very poor.
Good	Poor	Very poor	Good	Good	Very poor.
Good	Poor	Very poor	Good	Good	Very poor.
Fair	Good	Good	Fair	Fair	Good.
Fair	Good	Good	Poor	Fair	Good.
Fair	Good	Good	Fair	Fair	Good.
Fair	Poor	Poor	Good	Fair	Poor.
Fair	Poor	Very poor	Good	Fair	Very poor.
Fair	Very poor	Very poor	Fair	Fair	Very poor.

significant to engineering

Percentage less than 3 inches passing sieve [2]—				Liquid limit	Plasticity index	Permeability	Available water capacity	Reaction	Shrink-swell potential	Corrosivity to—	
No. 4 (4.7 mm)	No. 10 (2.0 mm)	No. 40 (0.42 mm)	No. 200 (0.074 mm)							Uncoated steel [3]	Concrete [4]
				Pct		*In per hr*	*In per in of soil*	*pH*			
100	100	80–100	11–25	-------	[5] NP	6. 0–20. 0	0. 02–0. 05	4. 5–5. 5	Low	Moderate	High.
100	100	80–95	36–45	20–40	8–20	2. 0–6. 0	0. 10–0. 15	4. 5–5. 5	Low.		
100	100	80–95	36–45	20–40	8–20	0. 60–2. 0	0. 10–0. 15	4. 5–5. 5	Low.		
100	100	85–100	30–50	-------	NP	0. 60–2. 0	0. 12–0. 15	4. 5–5. 5	Low	High	High.
100	100	90–100	60–85	30–60	15–45	0. 06–0. 20	0. 15–0. 20	4. 5–5. 5	High.		
100	100	90–100	51–70	20–40	12–20	0. 06–0. 20	0. 15–0. 20	4. 5–5. 5	Moderate.		
100	95–100	70–90	13–25	-------	NP	2. 0–6. 0	0. 06–0. 10	4. 5–5. 5	Low	High	High.
100	95–100	65–90	20–35	20–30	5–10	2. 0–6. 0	0. 10–0. 15	4. 5–5. 5	Low.		
100	95–100	65–95	25–50	25–40	11–20	0. 60–2. 0	0. 10–0. 15	4. 5–5. 5	Low.		
100	90–100	55–95	30–50	35–65	15–35	0. 20–0. 60	0. 05–0. 10	4. 5–5. 5	Moderate.		

TABLE 5.—*Estimated soil properties*

Soil series and map symbols	Depth to seasonal high water table [1]	Depth from surface	Classification		
			USDA soil texture	Unified	AASHO
	In	*In*			
Bibb: Bb. Properties are those only of the Bibb soils in Bb.	0–15	0–10	Sandy loam, loam	SM	A–2–4, A–4
		10–60	Sandy loam, loam	SM	A–2–4, A–4
Bonifay: BoC	>73	0–57	Sandy, loamy sand	SP–SM, SM	A–2–4, A–3
		57–73	Sandy clay loam, sandy loam	SC–SM, SM	A–2–4
Chipley: Ch	20–40	0–90	Sand	SP–SM	A–3, A–2–4
Dothan: DoA, DoB, DoC, Dt. Properties are those only of the Dothan soils in Dt.	>72	0–8	Loamy sand, sandy loam	SM	A–2–4
		8–30	Sandy clay loam, sandy loam, fine sandy loam.	SC	A–2, A–4, A–6
		30–52	Sandy clay loam, sandy loam, fine sandy loam.	SC	A–2, A–4, A–6
		52–67	Sandy clay loam, sandy clay	SC	A–6
Faceville: FcB, FcC	>72	0–6	Sandy loam	SM	A–2–4
		6–9	Sandy clay loam	SC	A–2, A–4, A–6
		9–65	Sandy clay, clay	SC, CL, CH	A–6, A–7
Fuquay: FuC	>88	0–33	Loamy sand	SM	A–2–4
		33–45	Sandy loam, sandy clay loam	SC–SM, SC	A–2–4, A–4
		45–88	Sandy clay loam, sandy loam	SC	A–2, A–4, A–6
Gritney: GrB, GrC	>72	0–7	Loamy sand, sandy loam	SM	A–2–4
		7–12	Sandy clay loam	SC	A–2–7, A–6, A–7
		12–31	Sandy clay, clay	CH, CL, SC	A–7
		31–50	Sandy clay loam, sandy clay	CH, CL, SC	A–7
		50–68	Sandy clay loam with lenses of sandy loam, loamy sand, and sandy clay.	SC	A–2, A–6, A–7
Kenansville: Ke	>75	0–25	Fine sand, loamy fine sand	SM, SP–SM	A–2–4
		25–48	Fine sandy loam, sandy clay loam.	SC–SM, SC	A–4, A–2–4
		48–75	Fine sand, loamy fine sand	SM, SP–SM	A–2–4
Lakeland: Ld	>84	0–84	Sand, fine sand	SP–SM	A–3, A–2–4
Leefield: Le	15–30	0–23	Loamy sand, sand	SM	A–2–4
		23–65	Sandy clay loam, sandy loam	SC, SC–SM	A–4, A–6
Lucy: LuC	>80	0–28	Loamy sand	SM	A–2–4
		28–37	Sandy loam, sandy clay loam	SM, SC–SM	A–2–4, A–4
		37–80	Sandy clay loam, sandy loam	SC, SC–SM	A–4, A–6, A–2
Maxton: Md	>72	0–9	Loamy fine sand, loamy sand	SM	A–2–4
		9–41	Sandy clay loam, fine sandy loam.	SC, SC–SM	A–4, A–6
		41–65	Sand, loamy sand	SP–SM, SM	A–3, A–2–4

See footnotes at end of table.

significant to engineering—Continued

Percentage less than 3 inches passing sieve [2]—				Liquid limit	Plasticity index	Permeability	Available water capacity	Reaction	Shrink-swell potential	Corrosivity to—	
No. 4 (4.7 mm)	No. 10 (2.0 mm)	No. 40 (0.42 mm)	No. 200 (0.074 mm)							Uncoated steel [3]	Concrete [4]
				Pct		*In per hr*	*In per in of soil*	*pH*			
95–100	90–100	60–100	30–50	-------	NP	0. 60–2. 0	0. 15–0. 18	4. 5–5. 5	Low	High	High.
95–100	90–100	60–100	30–50	-------	NP	0. 60–2. 0	0. 12–0. 15	4. 5–5. 5	Low.		
100	95–100	70–95	5–20	-------	NP	6. 0–20. 0	0. 05–0. 10	4. 5–5. 5	Low	Low	High.
100	95–100	70–95	20–35	<30	NP–7	0. 60–2. 0	0. 10–0. 15	4. 5–5. 5	Low.		
100	100	75–95	6–12	-------	NP	6. 0–20. 0	0. 05–0. 08	4. 5–5. 5	Low	Moderate	High.
100	95–100	75–90	15–35	-------	NP	2. 0–6. 0	0. 07–0. 10	4. 5–5. 5	Low	Moderate	Moderate.
100	95–100	75–90	30–40	20–35	8–15	0. 60–2. 0	0. 10–0. 15	4. 5–5. 5	Low.		
100	95–100	75–90	30–45	20–40	8–20	0. 20–0. 60	0. 10–0. 15	4. 5–5. 5	Low.		
100	95–100	75–90	36–50	20–55	11–30	0. 20–0. 60	0. 10–0. 15	4. 5–5. 5	Low.		
100	95–100	75–95	25–35	-------	NP	2. 0–6. 0	0. 10–0. 15	4. 5–5. 5	Low	Moderate	Moderate.
100	95–100	75–95	30–50	20–40	8–20	0. 60–2. 0	0. 10–0. 15	4. 5–5. 5	Low.		
100	95–100	80–95	45–75	30–60	15–40	0. 60–2. 0	0. 15–0. 15	4. 5–5. 5	Moderate.		
100	95–100	70–95	13–25	-------	NP	6. 0–20. 0	0. 05–0. 10	4. 5–5. 5	Low	Low	Low.
100	95–100	90–100	25–40	18–30	4–10	2. 0–6. 0	0. 10–0. 15	4. 5–5. 5	Low.		
100	95–100	75–90	30–45	20–40	8–20	0. 06–0. 20	0. 10–0. 15	4. 5–5. 5	Low.		
100	100	75–90	15–25	-------	NP	6. 0–20. 0	0. 05–0. 10	4. 5–5. 5	Low	High	Moderate.
100	100	75–95	30–45	41–55	11–35	0. 60–2. 0	0. 10–0. 15	4. 5–5. 5	High.		
100	100	80–100	45–65	41–70	20–40	0. 06–0. 20	0. 10–0. 15	4. 5–5. 5	High.		
100	100	80–100	40–60	41–60	20–35	0. 20–0. 60	0. 10–0. 15	4. 5–5. 5	High.		
100	100	80–100	30–50	35–55	15–35	0. 20–0. 60	0. 10–0. 15	4. 5–5. 5	High.		
100	100	90–100	11–25	-------	NP	6. 0–20. 0	0. 05–0. 10	4. 5–5. 5	Low	Low	High.
100	100	90–100	25–45	18–30	4–10	2. 0–6. 0	0. 10–0. 15	4. 5–5. 5	Low.		
100	100	95–100	11–25	-------	NP	6. 0–20. 0	0. 05–0. 10	4. 5–5. 5	Low.		
100	95–100	70–100	5–12	-------	NP	6. 0–20. 0	0. 03–0. 07	4. 5–5. 5	Low.	High	Low.
100	100	60–95	13–25	-------	NP	6. 0–20. 0	0. 05–0. 10	4. 5–5. 5	Low	High	High.
100	100	65–95	36–50	18–40	4–20	0. 20–0. 60	0. 10–0. 15	4. 5–5. 5	Low.		
100	95–100	70–90	13–30	-------	NP	6. 0–20. 0	0. 07–0. 10	4. 5–5. 5	Low	High	Low.
100	95–100	75–85	25–40	<25	NP–7	2. 0–6. 0	0. 10–0. 12	4. 5–5. 5	Low.		
100	95–100	80–95	30–45	18–40	4–20	0. 60–2. 0	0. 12–0. 14	4. 5–5. 5	Low.		
100	100	85–90	15–25	-------	NP	6. 0–20. 0	0. 05–0. 10	4. 5–5. 5	Low	High	Low.
100	100	70–95	36–50	18–40	4–20	0. 60–2. 0	0. 10–0. 15	4. 5–5. 5	Low.		
100	100	70–95	5–20	-------	NP	6. 0–20. 0	0. 05–0. 10	4. 5–5. 5	Low.		

TABLE 5.—*Estimated soil properties*

Soil series and map symbols	Depth to seasonal high water table [1]	Depth from surface	Classification: USDA soil texture	Classification: Unified	Classification: AASHO
	In	*In*			
Orangeburg: OrB, OrC	>108	0–10	Loamy sand, loamy fine sand, sandy loam, fine sandy loam.	SM	A-2-4
		10–21	Sandy loam, sandy clay loam, fine sandy loam.	SC-SM, SC	A-2-4
		21–108	Sandy clay loam, sandy loam, fine sandy loam.	SC-SM, SC	A-6, A-4, A-2
Pansey: Pa	0–15	0–12	Loamy sand	SM	A-2-4
		12–24	Sandy loam, sandy clay loam	SC-SM, SM	A-2-4
		24–69	Sandy clay loam, sandy loam	SC	A-2-6, A-6
Pantego: Pg. Properties are those only of the Pantego soils in Pg.	0–15	0–13	Loamy fine sand, fine sandy loam.	SM	A-2-4
		13–62	Sandy clay loam, sandy loam	SC-SM, SC	A-6, A-4, A-2
Plummer: Pm	0–15	0–44	Fine sand, loamy fine sand	SM	A-2-4
		44–65	Fine sandy loam, sandy clay loam.	SC-SM, SC	A-2, A-4, A-6
Stilson: StA	30–40	0–25	Loamy sand, sand	SM	A-2-4
		25–68	Sandy clay loam, sandy loam	SC-SM, SC	A-4, A-6, A-2
Tifton: TfB, TfC	>72	0–8	Loamy sand, sandy loam	SM	A-2-4, A-1-b
		8–65	Sandy clay loam, sandy loam	SC	A-4, A-6
Troup: TrC	>83	0–45	Sand	SM	A-2-4
		45–58	Sand with nodules of loamy sand.	SM	A-2-4
		58–83	Sandy clay loam, sandy loam	SC, SC-SM	A-4, A-6, A-2

[1] Level expected during the normal wet season.
[2] For all soils mapped in this county, the coarse fraction greater than 3 inches in diameter is 0.

TABLE 6.—*Engineering*

[Tests performed by Florida State Department of Transportation (FDOT) in accordance with

Soil name and location	Parent material	Sample number [1]	Depth from surface	Moisture density [2]: Maximum dry density	Moisture density [2]: Optimum moisture
			In	*Lb per cu ft*	*Pct*
Angie fine sandy loam: Approximately 1.5 miles northwest of Westville and 0.25 mile south of State Highway No. 181 in the NW¼SE¼ sec. 6, T. 4 N., R. 16 W. (Modal)	Loamy marine deposits	69 Fla. 30-4-4	12–26	90	21
		69 Fla. 30-4-6	40–69	98	21
		69 Fla. 30-4-7	69–75	110	17
Ardilla loamy sand: Approximately 3 miles east of Bonifay and 1 mile north of U.S. Highway No. 90 and 100 feet west of a good motor road in the NE¼SE¼ sec. 33, T. 5 N., R. 14 W. (Modal)	Loamy marine deposits	70 Fla. 30-25-3	9–16	121	105
		70 Fla. 30-25-4	16–36	120	12
		70 Fla. 30-25-6	48–65	105	18

See footnotes at end of table.

significant to engineering—Continued

Percentage less than 3 inches passing sieve [2]—				Liquid limit	Plasticity index	Permeability	Available water capacity	Reaction	Shrink-swell potential	Corrosivity to—	
No. 4 (4.7 mm)	No. 10 (2.0 mm)	No. 40 (0.42 mm)	No. 200 (0.074 mm)							Uncoated steel [3]	Concr te [4]
				Pct		*In per hr*	*In per in of soil*	*pH*			
100	95–100	70–95	15–35	-------	NP	2. 0–6. 0	0. 06–0. 10	4. 5–5. 5	Low-------	High-------	Low.
100	95–100	70–95	25–35	<28	NP–7	2. 0–6. 0	0. 10–0. 15	4. 5–5. 5	Low-------	High-------	Low.
100	95–100	80–95	30–50	18–40	4–20	0. 60–2. 0	0. 10–0. 15	4. 5–5. 5	Low.		
100	95–100	75–90	13–20	-------	NP	2. 0–6. 0	0. 06–0. 10	4. 5–5. 5	Low-------	High-------	High.
100	95–100	75–90	20–35	<28	NP–7	2. 0–6. 0	0. 10–0. 14	4. 5–5. 5	Low.		
100	95–100	75–90	30–45	20–40	11–20	0. 06–0. 20	0. 10–0. 14	4. 5–5. 5	Low.		
100	95–100	85–95	15–35	-------	NP	2. 0–6. 0	0. 07–0. 10	4. 5–5. 5	Low-------	High-------	High.
100	95–100	85–90	30–45	18–40	4–20	0. 60–2. 0	0. 10–0. 15	4. 5–5. 5	Low.		
100	100	80–95	13–25	-------	NP	6. 0–20. 0	0. 05–0. 08	4. 5–5. 5	Low-------	High-------	High.
100	100	75–90	25–45	18–40	4–20	0. 60–2. 0	0. 10–0. 15	4. 5–5. 5	Low.		
100	95–100	70–95	13–25	-------	NP	6. 0–2. 0	0. 06–0. 10	4. 5–5. 5	Low-------	High-------	Moderate.
100	95–100	70–95	30–50	18–40	4–20	0. 60–2. 0	0. 10–0. 15	4. 5–5. 5	Low.		
95–100	80–95	45–85	13–25	-------	NP	6. 0–20. 0	0. 06–0. 10	4. 5–5. 5	Low-------	High-------	Moderate.
95–100	80–100	70–90	36–45	20–40	11–20	0. 60–2. 0	0. 10–0. 15	4. 5–5. 5	Low.		
100	95–100	75–95	13–20	-------	NP	6. 0–20. 0	0. 05–0. 09	4. 5–5. 5	Low-------	High-------	Low.
100	100	75–90	15–25	-------	NP	6. 0–20. 0	0. 06–0. 08	4. 5–5. 5	Low.		
100	100	75–90	30–45	18–40	4–20	0. 60–2. 0	0. 10–0. 15	4. 5–5. 5	Low.		

[3] Estimates are based on the drainage class (wetness) and texture of the soil, the estimated total acidity, the estimated electrical resistivity at moisture equivalent, and the estimated electrical conductivity.
[4] Estimates are based on soil texture and reaction and the estimated amount of sodium, magnesium sulfate, or both present in the soil.

test data

standard procedures of the American Association of State Highway Officials (AASHO)]

Mechanical analysis [3]								Liquid limit	Plasticity index	Classification	
Percentage less than 3 inches passing sieve—				Percentage smaller than—							
No. 4 (4.7 mm)	No. 10 (2.0 mm)	No. 40 (0.42 mm)	No. 200 (0.074 mm)	0. 05 mm	0. 02 mm	0. 005 mm	0. 002 mm			AASHO [4]	Unified [5]
								Pct			
100	100	99	79	74	53	49	41	49	27	A–7–6(17)	CL
100	100	99	76	70	48	44	35	54	39	A–7–6(19)	CH
100	100	100	64	53	30	27	22	35	18	A–6(9)	CL
100	99	68	27	24	19	14	13	20	9	A–2–4(0)	SC
100	96	67	29	26	18	16	15	24	11	A–2–6(0)	SC
100	93	59	37	36	32	30	30	61	31	A–7–5(5)	SC

TABLE 6.—*Engineering*

Soil name and location	Parent material	Sample number [1]	Depth from surface	Moisture density [2]	
				Maximum dry density	Optimum moisture
			In	*Lb per cu ft*	*Pct*
Dothan loamy sand: Approximately 7 miles north of the city limits of Bonifay and about 100 yards east of U.S. Highway No. 79 in the NW¼NE¼ sec. 32, T. 6 N., R. 14 W. (Modal)	Loamy marine deposits	69 Fla. 30–2–1	0–8	113	12
		69 Fla. 30–2–3	13–30	121	11
		69 Fla. 30–2–7	61–67	103	21
Faceville sandy loam: Approximately 1 mile north of Wrights Creek Bridge and 0.25 mile west of State Highway No. 79 on the north side of a good motor road in the NE¼SW¼ sec. 29, T. 6 N., R. 14 W. (Modal)	Clayey marine deposits	69 Fla. 30–9–2	5–19	110	17
		69 Fla. 30–9–3	19–38	104	19
Fuquay loamy sand: Approximately 2 miles west of Bonifay and 0.25 mile south of U.S. Highway No. 90 in the SE¼SE¼ sec. 34, T. 5 N., R. 15 W. (Modal)	Loamy marine deposits	69 Fla. 30–6–3	13–33	123	9
		69 Fla. 30–6–4	33–45	120	12
		69 Fla. 30–6–6	57–88	112	15
Gritney loamy sand: Approximately 2.25 miles east of the city limits of Bonifay on Old Chipley Road, 100 feet south of the road in the NE¼NE¼ sec. 34, T. 5 N., R. 14 W. (Modal)	Clayey marine deposits	69 Fla. 30–1–6	18–31	95	23
		69 Fla. 30–1–7	50–68	108	17
Kenansville fine sand: Approximately 2 miles north of the city limits of Caryville and ½ mile west of State Highway No. 179 on the west side of the good motor road in the SW¼SW¼ sec. 35, T. 5 N., R. 16 W. (Modal)	Loamy fluvial sediments	70 Fla. 30–27–4	25–37	112	14
		70 Fla. 30–27–6	48–75	98	17
Lucy loamy sand: Approximately 0.75 mile southeast of Sandy Creek Church on the west side of a good motor road in the NE¼NE¼ sec. 35, T. 5 N., R. 16 W. (Modal)	Loamy marine deposits	69 Fla. 30–8–1	0–7	112	11
		69 Fla. 30–8–3	14–28	123	10
		69 Fla. 30–8–5	37–80	112	15
Orangeburg loamy sand: Approximately 4.5 miles north of the city limits of Ponce de Leon on the west side of State Highway No. 81 in the SW¼SW¼ sec. 32, T. 5 N., R. 17 W. (Modal)	Loamy marine deposits	69 Fla. 30–5–3	10–17	126	9
		69 Fla. 30–5–5	21–54	113	14
		69 Fla. 30–5–6	54–108	117	13
Pansey loamy sand: Approximately 0.75 mile southwest of Bethlehem School and 50 yards south of a good motor road in the NE¼NE¼ sec. 20, T. 6 N., R. 15 W. (Modal)	Loamy marine deposits	69 Fla. 30–17–4	12–24	126	9
		69 Fla. 30–17–6	36–63	120	12
		69 Fla. 30–17–7	63–69	115	13
Stilson loamy sand: Approximately 3 miles north of Gritney Crossroads and 0.5 mile east of State Highway No. 179 and 0.25 mile north of a good motor road in the NE¼SE¼ sec. 5, T. 5 N., R. 16 W. (Modal)	Loamy marine deposits	69 Fla. 30–18–5	39–45	110	16
		69 Fla. 30–18–6	45–68	111	15

[1] Sample numbers of the Florida State Department of Transportation.
[2] Based on AASHO Designation T 99–57 (*1*).
[3] Mechanical analysis according to AASHO Designation T 88–57 (*1*). Results by this procedure may differ somewhat from results obtained by the soil survey procedure of the Soil Conservation Service (SCS). In the AASHO procedure the fine material is analyzed by the hydrometer method and the various grain-size fractions are calculated on the basis of all the material, including that coarser than 2 millimeters in diameter. In the SCS soil survey procedure, the fine material is analyzed by the pipette method and the material coarser than 2

test data—Continued

Mechanical analysis [3]								Liquid limit	Plasticity index	Classification	
Percentage less than 3 inches passing sieve—				Percentage smaller than—							
No. 4 (4.7 mm)	No. 10 (2.0 mm)	No. 40 (0.42 mm)	No. 200 (0.074 mm)	0.05 mm	0.02 mm	0.005 mm	0.002 mm			AASHO [4]	Unified [5]
								Pct			
100	99	89	19	13	5	4	3	----------	[6] NP	A-2-4(0)	SM
100	97	84	33	29	20	18	16	21	10	A-2-4(0)	SC
100	99	85	47	45	40	37	35	51	28	A-7-6(9)	SC
100	97	81	48	46	40	38	32	37	20	A-6(6)	SC
100	99	87	55	53	48	46	42	46	22	A-7-6(9)	CL
100	98	76	22	20	13	11	8	----------	NP	A-2-4(0)	SM
100	100	94	35	30	19	18	12	20	7	A-2-4(0)	SM-SC
100	98	76	36	35	26	25	22	32	16	A-6(1)	SC
100	100	97	58	57	53	51	47	50	27	A-7-6(13)	CH
100	100	82	35	34	33	31	30	52	33	A-2-7(5)	SC
100	100	99	44	34	21	20	19	24	7	A-4(2)	SM-SC
100	100	100	17	11	4	4	3	----------	NP	A-2-4(0)	SM
100	100	75	14	12	5	4	1	----------	NP	A-2-4(0)	SM
100	100	81	21	19	13	11	7	----------	NP	A-2-4(0)	SM
100	100	84	39	38	34	33	30	34	16	A-6(2)	SC
100	99	79	25	22	14	11	9	----------	NP	A-2-4(0)	SM
100	100	93	41	37	28	26	23	30	17	A-6(3)	SC
100	99	89	36	32	24	23	20	29	14	A-6(1)	SC
100	98	78	27	23	14	12	11	----------	NP	A-2-4(0)	SM
100	99	80	32	28	19	16	16	23	12	A-2-6(0)	SC
100	99	81	44	41	30	26	25	31	19	A-6(4)	SC
100	99	76	38	36	29	29	28	38	14	A-6(2)	SC
100	97	72	36	34	30	27	26	37	15	A-6(1)	SC

millimeters in diameter is excluded from calculations of grain-size fractions. The mechanical analysis data used in this table are not suitable for naming textured classes for soils.

[4] Based on AASHO Designation M 145-49(*1*).

[5] Based on the Unified Soil Classification System (*11*). SCS and BPR have agreed that all soils having a plasticity index within two points from A-line are to be given a borderline classification. An example of a borderline classification is SM-SC.

[6] Nonplastic.

TABLE 7.—*Estimated engineering*

Soil series and map symbol	Suitability as source of—		
	Topsoil	Sand	Road fill
Albany: Ab	Poor: soil material too sandy	Poor to fair	Good
Angie: An	Poor: thin surface layer	Unsuited	Poor: high shrink-swell potential; low shear strength.
Ardilla: Ar	Fair: soil material too sandy	Unsuited	Fair: low shear strength; wetness.
Bibb: Bb	Poor: wetness	Poor	Poor: wetness
Bonifay: BoC	Poor: soil material too sandy	Fair to poor	Good
Chipley: Ch	Poor: soil material too sandy	Fair	Good
Dothan:			
DoA	Poor: thin surface layer	Unsuited	Fair: low shear strength
DoB	Poor: thin surface layer	Unsuited	Fair: low shear strength
DoC, Dt	Poor: thin surface layer	Unsuited	Fair: low shear strength
Faceville: FcB, FcC	Poor: thin surface layer	Unsuited	Poor: low shear strength
Fuquay: FuC	Poor: soil material too sandy	Poor	Good
Gritney: GrB, GrC	Poor: thin surface layer	Unsuited	Poor: high shrink-swell potential; low shear strength.
Kenansville: Ke	Poor: soil material too sandy	Poor	Good

interpretations of soils

Soil features affecting—				
Pond reservoir areas	Embankments, dikes, and levees	Drainage of cropland and pasture	Irrigation	Terraces and diversions
Excessive permeability	Excessive permeability; piping hazard.	Wetness	Very low available water capacity; excessive permeability in upper 45 inches.	Not needed.
Features generally favorable.	Features generally favorable.	Restricted permeability	Restricted permeability; erodibility; slope.	Restricted permeability.
Features generally favorable.	Features generally favorable.	Wetness; restricted permeability.	Wetness; restricted permeability.	Not needed.
Excessive permeability; subject to flooding.	Excessive permeability; piping hazard; subject to flooding.	Wetness	Wetness	Not needed.
Excessive permeability	Excessive permeability; piping hazard.	Not needed; well drained.	Excessive permeability; low available water capacity.	Not needed.
Excessive permeability	Excessive permeability; piping hazard.	Features generally favorable.	Excessive permeability; low available water capacity.	Not needed.
Excessive permeability	Features generally favorable.	Not needed; well drained.	Features generally favorable.	Not needed.
Excessive permeability	Features generally favorable.	Not needed; well drained.	Erodibility; slope	Features generally favorable.
Excessive permeability	Features generally favorable.	Not needed; well drained.	Erodibility; slope	Slope.
Excessive permeability	Low shear strength	Not needed; well drained	Erodibility; slope	Not needed.
Excessive permeability	Excessive permeability; piping hazard.	Not needed; well drained	Excessive permeability; low available water capacity in upper 33 inches.	Not needed.
Features generally favorable.	Low shear strength	Not needed; well drained	Restricted permeability; erodibility; slope.	Restricted permeability; slope.
Excessive permeability	Excessive permeability; piping hazard.	Not needed; well drained	Excessive permeability; low available water capacity in upper 25 inches.	Not needed.

TABLE 7.—*Estimated engineering*

Soil series and map symbol	Suitability as source of—		
	Topsoil	Sand	Road fill
Lakeland: Ld	Poor: soil material too sandy	Fair	Good
Leefield: Le	Poor: soil material too sandy	Unsuited	Fair: wetness; low shear strength.
Lucy: LuC	Poor: soil material too sandy	Poor	Good
Maxton: Md	Poor: soil material too sandy	Fair to poor	Fair to depth of 41 inches: low shear strength. Good below depth of 41 inches.
Orangeburg: OrB, OrC	Fair: thin surface layer	Unsuited	Fair: low shear strength
Pansey: Pa	Poor: wetness	Unsuited	Poor: wetness
Pantego: Pg	Poor: wetness	Unsuited	Poor: wetness
Plummer: Pm	Poor: soil material too sandy	Poor	Poor: wetness
Stilson: StA	Poor: soil material too sandy	Unsuited	Fair: low shear strength
Tifton: TfB, TfC	Fair: thin surface layer	Unsuited	Fair: low shear strength
Troup: TrC	Poor: soil material too sandy	Poor	Good

interpretations of soils—Continued

Soil features affecting—				
Pond reservoir areas	Embankments, dikes, and levees	Drainage of cropland and pasture	Irrigation	Terraces and diversions
Excessive permeability	Excessive permeability; piping hazard.	Not needed; excessively drained.	Very low to low available water capacity.	Not needed.
Features generally favorable.	Low shear strength	Wetness; restricted permeability.	Wetness; excessive permeability; low available water capacity in upper 23 inches.	Not needed.
Excessive permeability	Excessive permeability; piping hazard.	Not needed; well drained	Excessive permeability; low available water capacity in upper 28 inches.	Not needed.
Excessive permeability	Features generally favorable except sand below depth of 41 inches.	Not needed; well drained	Erodibility; slope	Features generally favorable.
Excessive permeability	Features generally favorable.	Not needed; well drained.	Erodibility; slope	Features generally favorable.
Features generally favorable.	Features generally favorable.	Wetness; restricted permeability.	Wetness	Not needed.
Excessive permeability	Excessive permeability	Wetness; outlets	Wetness	Not needed.
Excessive permeability	Excessive permeability; piping hazard.	Wetness	Wetness; excessive permeability; low available water capacity in upper 44 inches.	Not needed.
Excessive permeability	Excessive permeability; piping hazard.	Features generally favorable.	Excessive permeability; low available water capacity in upper 25 inches.	Not needed.
Excessive permeability	Features generally favorable.	Not needed; well drained.	Erodibility; slope	Features generally favorable.
Excessive permeability	Not needed; well drained.	Not needed; well drained.	Excessive permeability; low available water capacity in upper 58 inches.	Not needed.

TABLE 8.—*Degree and kind of limitations for sanitary facilities*

Soil series and map symbols	Sanitary facilities			Dwellings and light industrial buildings	Local roads and streets
	Septic tank absorption fields	Sewage lagoons	Sanitary land fill [1]		
Albany: Ab	Severe: wetness	Severe: wetness; excessive permeability.	Severe: wetness; excessive permeability.	Moderate: wetness.	Moderate: wetness.
Angie: An	Severe: restricted permeability; wetness.	Slight	Severe: wetness	Severe: high shrink-swell potential.	Severe: high shrink-swell potential; low shear strength.
Ardilla: Ar	Severe: restricted permeability; wetness.	Slight	Severe: wetness	Severe: wetness	Moderate: wetness; low shear strength.
Bibb: Bb	Severe: wetness; subject to flooding.	Severe: wetness; subject to flooding.	Severe: wetness; subject to flooding.	Severe: wetness; subject to flooding.	Severe: wetness; subject to flooding.
Bonifay: BoC	Slight	Severe: excessive permeability.	Severe: excessive permeability; soil material too sandy.	Slight	Moderate: slope
Chipley: Ch	Severe: wetness	Severe: excessive permeability; wetness.	Severe: wetness; excessive permeability; soil material too sandy.	Moderate: wetness.	Moderate: wetness.
Dothan:					
DoA	Severe: restricted permeability.	Slight	Slight	Slight	Moderate: low shear strength.
DoB	Severe: restricted permeability.	Moderate: slope	Slight	Slight	Moderate: low shear strength.
DoC	Severe: restricted permeability; slope.	Moderate: slope	Slight	Slight	Moderate: low shear strength.
Dt	Severe: restricted permeability.	Severe: slope	Slight	Moderate: slope	Severe: slope
Faceville:					
FcB	Slight	Moderate: slope; excessive permeability.	Slight	Moderate: moderate shrink-swell potential.	Severe: low shear strength.
FcC	Moderate: slope	Moderate: slope; excessive permeability.	Slight	Moderate: moderate shrink-swell potential.	Severe: low shear strength.
Fuquay: FuC	Severe: restricted permeability.	Moderate: possible lateral seepage.	Slight	Slight	Moderate: slope
Gritney:					
GrB	Severe: restricted permeability.	Moderate: slope	Slight	Severe: high shrink-swell potential.	Severe: high shrink-swell potential; low shear strength.
GrC	Severe: restricted permeability.	Moderate: slope	Slight	Severe: high shrink-swell potential.	Severe: high shrink-swell potential; low shear strength.

See footnote at end of table.

recreational areas, and other specified engineering uses

Recreational areas for— Camping	Picnicking	Playgrounds	Golf course fairways	Paths and trails	Shallow excavations
Severe: soil material too sandy.	Severe: soil material too sandy.	Severe: soil material too sandy.	Severe: soil material too sandy.	Severe: soil material too sandy.	Severe: wetness; soil material too sandy.
Moderate: restricted permeability.	Slight	Moderate: restricted permeability.	Moderate: restricted permeability.	Slight	Moderate: wetness; too much clay in subsoil.
Moderate: wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.	Severe: wetness.
Severe: wetness; subject to flooding.	Severe: wetness; subject to flooding.	Severe: wetness; subject to flooding.	Severe: wetness; subject to flooding.	Severe: wetness; subject to flooding.	Severe: wetness; subject to flooding.
Severe: soil material too sandy.	Severe: soil material too sandy.	Severe: soil material too sandy.	Severe: soil material too sandy.	Severe: soil material too sandy.	Severe: soil material too sandy.
Severe: soil material too sandy.	Severe: soil material too sandy.	Severe: soil material too sandy.	Severe: soil material too sandy.	Severe: soil material too sandy.	Severe: soil material too sandy; wetness.
Moderate: restricted permeability.	Slight	Moderate: restricted permeability.	Moderate: restricted permeability.	Slight	Slight.
Moderate: restricted permeability.	Slight	Moderate: restricted permeability.	Moderate: restricted permeability.	Slight	Slight.
Moderate: restricted permeability.	Slight	Severe: slope	Severe: slope	Slight	Slight.
Moderate: slope	Moderate: slope	Severe: slope	Severe: slope	Slight	Moderate: slope.
Slight	Slight	Moderate: slope	Slight	Slight	Moderate: too much clay in subsoil.
Slight	Slight	Severe: slope	Moderate: slope	Slight	Moderate: too much clay in subsoil.
Moderate: soil material too sandy.	Moderate: soil material too sandy.	Moderate: slope	Slight	Moderate: soil material too sandy.	Severe: soil material too sandy.
Slight	Slight	Moderate: slope; soil material too sandy.	Slight	Slight	Moderate: too much clay in subsoil.
Slight	Slight	Severe: slope	Moderate: slope	Slight	Moderate: too much clay in subsoil.

TABLE 8.—*Degree and kind of limitations for sanitary facilities, recreational*

Soil series and map symbols	Sanitary facilities			Dwellings and light industrial buildings	Local roads and streets
	Septic tank absorption fields	Sewage lagoons	Sanitary landfill [1]		
Kenansville: Ke	Slight	Severe: excessive permeability.	Severe: excessive permeability.	Slight	Slight
Lakeland: Ld	Slight	Severe: excessive permeability.	Severe: excessive permeability; soil material too sandy.	Slight	Slight
Leefield: Le	Severe: restricted permeability; wetness.	Severe: wetness	Severe: wetness	Moderate: wetness.	Moderate: wetness; low shear strength.
Lucy: LuC	Slight	Moderate: slope; excessive permeability.	Slight	Slight	Moderate: low shear strength.
Maxton: Md	Slight	Severe: excessive permeability.	Severe: excessive permeability.	Slight	Moderate: low shear strength.
Orangeburg:					
OrB	Slight	Moderate: excessive permeability; slope.	Slight	Slight	Moderate: low shear strength.
OrC	Slight	Moderate: excessive permeability; slope.	Slight	Slight	Moderate: low shear strength.
Pansey: Pa	Severe: restricted permeability; wetness; subject to flooding.	Severe: wetness; subject to flooding.	Severe: wetness; subject to flooding.	Severe: wetness; subject to flooding.	Severe: wetness; subject to flooding.
Pantego: Pg	Severe: wetness; subject to flooding.	Severe: wetness; subject to flooding.	Severe: wetness; subject to flooding.	Severe: wetness; subject to flooding.	Severe: wetness; subject to flooding.
Plummer: Pm	Severe: wetness; subject to flooding.	Severe: wetness; subject to flooding.	Severe: wetness; subject to flooding.	Severe: wetness; subject to flooding.	Severe; wetness; subject to flooding.
Stilson: StA	Severe: wetness	Moderate: excessive permeability.	Severe: wetness	Slight	Moderate: low shear strength.
Tifton:					
TfB	Moderate: restricted permeability.	Moderate: excessive permeability; slope.	Slight	Slight	Moderate: low shear strength.
TfC	Moderate: restricted permeability.	Moderate: excessive permeability; slope.	Slight	Slight	Moderate: low shear strength; slope.
Troup: TrC	Slight	Severe: excessive permeability.	Severe: excessive permeability; soil material too sandy.	Slight	Slight to moderate: slope.

[1] Onsite deep studies of the underlying strata, water tables, and hazards of aquifer pollution and drainage into ground water need to be made for landfills deeper than 5 or 6 feet.

areas, and other specified engineering uses—Continued

Recreational areas for—					Shallow excavations
Camping	Picnicking	Playgrounds	Golf course fairways	Paths and trails	
Moderate: soil material too sandy.	Moderate: soil material too sandy.	Moderate: soil material too sandy; slope.	Moderate: soil material too sandy.	Moderate: soil material too sandy.	Slight.
Severe: soil material too sandy.	Severe: soil material too sandy.	Severe: soil material too sandy.	Severe: soil material too sandy.	Severe: soil material too sandy.	Severe: soil material too sandy.
Moderate: wetness; restricted permeability.	Moderate: wetness	Moderate: wetness; restricted permeability.	Moderate: wetness; restricted permeability.	Moderate: wetness	Severe: wetness.
Moderate: soil material too sandy.	Moderate: soil material too sandy.	Moderate: soil material too sandy; slope.	Moderate: soil material too sandy.	Moderate: soil material too sandy.	Slight.
Slight	Slight	Moderate: slope	Slight	Slight	Slight.
Slight	Slight	Moderate: slope	Slight	Slight	Slight.
Slight	Slight	Severe: slope	Moderate: slope	Slight	Slight.
Severe: wetness; subject to flooding.	Severe: wetness; subject to flooding.	Severe: wetness; subject to flooding.	Severe: wetness; subject to flooding.	Severe: wetness; subject to flooding.	Severe: wetness; subject to flooding.
Severe: wetness; subject to flooding.	Severe: wetness; subject to flooding.	Severe: wetness; subject to flooding.	Severe: wetness; subject to flooding.	Severe: wetness; subject to flooding.	Severe: wetness; subject to flooding.
Severe: wetness; subject to flooding.	Severe: wetness; subject to flooding.	Severe: wetness; subject to flooding.	Severe: wetness; subject to flooding.	Severe: wetness; subject to flooding.	Severe: wetness; subject to flooding; soil material too sandy.
Moderate: soil material too sandy.	Moderate: soil material too sandy.	Moderate: soil material too sandy.	Moderate: soil material too sandy.	Moderate: soil material too sandy.	Moderate: soil material too sandy.
Slight	Slight	Moderate: slope	Slight	Slight	Slight.
Slight	Slight	Severe: slope	Moderate: slope	Slight	Slight.
Severe: soil material too sandy.	Severe: soil material too sandy.	Severe: soil material too sandy.	Severe: soil material too sandy.	Severe: soil material too sandy.	Severe: soil material too sandy.

Corrosivity, as used in table 5, pertains to potential soil-induced chemical action that dissolves or weakens uncoated steel or concrete. Rate of corrosion of uncoated steel is related to soil properties such as drainage, texture, total acidity, and electrical conductivity of the soil material. Corrosivity for concrete is influenced mainly by the content of sodium or magnesium sulfate in the soil but also by soil texture and acidity. Installations of uncoated steel that intersect soil boundaries or soil horizons are more susceptible to corrosion than installations entirely in one kind of soil or in one soil horizon. A corrosivity rating of low means that there is a low probability of soil-induced corrosion damage. A rating of high means that there is a high probability of damage, so that protective measures for steel and more resistant concrete should be used to avoid or minimize damage.

Soil Test Data

Table 6 contains engineering test data for some of the major soil series in Holmes County. These tests were made to help evaluate the soils for engineering purposes. The engineering classifications given are based on data obtained by mechanical analyses and by tests to determine liquid limits and plastic limits. The mechanical analyses were made by combined sieve and hydrometer methods.

Compaction (or moisture-density) data are important in earthwork. If a soil material is compacted at successively higher moisture contents, with a constant compactive effort, the density of the compacted material increases until the *maximum density* is reached. After that, density decreases with increase in moisture content. The moisture content at maximum density is termed the *optimum moisture content.* For convenience, the maximum density is normally quoted in terms of the maximum dry density by weight. As a rule, maximum strength of earthwork is obtained if the soil is compacted to the maximum dry density.

Tests to determine liquid limit and plastic limit measure the effect of water on the consistence of soil material, as has been explained for table 5.

Engineering Interpretations of the Soils

The estimated interpretations in tables 7 and 8 are based on the engineering properties of soils shown in table 5, on test data for soils in this survey area and others nearby or adjoining, and on the experience of engineers and soil scientists with the soils of Holmes County. Table 7 lists those soil features not to be overlooked in planning, installation, and maintenance for such purposes as highways, pond reservoirs, pond embankments, drainage of cropland and pasture, irrigation, and terraces and diversions. Table 8 gives the degree and kinds of limitations for recreational and other specified uses.

Following are explanations of the columns in table 7.

Topsoil is used for topdressing an area where vegetation is to be established and maintained. Suitability is affected mainly by ease with which soil material can be worked and spread, as in preparing a seedbed; natural fertility of the material, or the response of plants when fertilizer is applied; and absence of substances toxic to plants. Texture of the soil material and its content of stone fragments are characteristics that affect suitability, but also considered in the ratings is damage that will result at the area from which topsoil is taken.

Sand is used in great quantities in many kinds of construction. The ratings in table 8 provide guidance about where to look for probable sources. A soil rated as a good or fair source of sand generally has a layer of sand at least 3 feet thick, the top of which is at a depth of less than 6 feet. The ratings do not take into account thickness of overburden, location of the water table, or other factors that affect mining of the materials, and neither do they indicate quality of the deposit.

Road fill is soil material used in embankments for roads. The suitability ratings reflect (1) the predicted performance of soil after it has been placed in an embankment that has been properly compacted and provided with adequate drainage, and (2) the relative ease of excavating the material at borrow areas.

Pond reservoir areas hold water behind a dam or embankment. Soils suitable for pond reservoir areas have low seepage, which is related to their permeability and depth to fractured or permeable bedrock or other permeable material.

Embankments, dikes, and levees require soil material resistant to seepage and piping and of favorable stability, shrink-swell potential, shear strength, and compactibility. Presence of stones or organic material in a soil are among factors that are unfavorable.

Drainage of cropland and pasture is affected by such soil properties as permeability, texture, and structure; depth to claypan, rock, or other layers that influence rate of water movement; depth to the water table; slope; stability in ditchbanks; susceptibility to stream overflow; salinity or alkalinity; and availability of outlets for drainage.

Irrigation of soil is affected by such features as slope; water erosion; soil texture; content of stones; accumulations of salts and alkali; depth of root zone; rate of water intake at the surface; permeability of soil layers below the surface layer and in fragipans or other layers that restrict movement of water; amount of water held available to plants; and need for drainage, or depth to water table or bedrock.

Terraces and diversions are embankments, or ridges, constructed across the slope to intercept runoff so that it soaks into the soil or flows slowly to a prepared outlet. Features that affect suitability of a soil for terraces are uniformity and steepness of slope; depth to bedrock or other unfavorable material; presence of stones; permeability; and resistance to water erosion. A soil suitable for these structures provides outlets for runoff and is not difficult to vegetate.

In table 8 the soils are rated as having slight, moderate, or severe limitations for the specified uses. For all of these ratings, it is assumed that a good cover of vegetation can be established and maintained. Slight means that soil properties are generally favorable and limitations are so minor that they easily can be overcome. Moderate means that the limitation can be overcome or modified by planning, by design, or by special maintenance. Severe means that costly soil reclamation, special design, intense maintenance, or a combination of these, is required.

Following are explanations of some of the columns in table 8.

Septic tank absorption fields are subsurface systems of tile or perforated pipe that distribute effluent from a septic tank into natural soil. The soil material from a depth of 18 inches to 6 feet is evaluated. The soil properties considered are those that affect both absorption of effluent and construction and operation of the system. Properties that affect absorption are permeability, depth to water table (wetness) or rock, and susceptibility to flooding. Slope is a soil property that affects difficulty of layout and construction and also the risk of soil erosion, lateral seepage, and downslope flow of effluent. Large rocks or boulders increase construction costs.

Sewage lagoons are ponds constructed to hold sewage long enough for bacteria to decompose the solids. A lagoon has a nearly level floor, sloping sides, and embankments. Embankments are compacted to medium density and the pond is protected from flooding. Properties are considered that affect the pond floor, excavated slopes, and the embankment. Those that affect the pond floor and excavated slopes are permeability, content of organic matter, and depth to bedrock. The soil properties that affect the embankment are the engineering properties of the embankment material as interpreted from the Unified Soil Classification and the amount of stones, if any, that influence the ease of excavation and compaction of the embankment material.

Sanitary land filling is a method of disposing of refuse in excavated trenches. The waste is spread in thin layers, compacted, and covered with soil. Land fill areas are subject to heavy vehicular traffic. Some soil properties that affect suitability for land fill are ease of excavation, hazard of polluting ground water, and trafficability. The best soils have moderately slow permeability, withstand heavy traffic, and are friable and easy to excavate. Unless otherwise stated, the ratings in table 7 apply only to a depth of about 6 feet, and limitation ratings of *slight* or *moderate* might not be valid if trenches are deeper than that. For some soils, reliable predictions can be made to a depth of 10 or 15 feet. However, every site should be investigated before it is selected.

As rated in table 7, dwellings are not more than three stories high, and light industrial buildings are less than three stories high or have foundation loads not in excess of that weight. The dwellings and buildings are supported by foundation footings placed in undisturbed soil. The features that affect the rating of a soil for dwellings and light industrial buildings are those that relate to capacity to support load and resist settlement under load and those that relate to ease of excavation. Soil properties that affect capacity to support load are wetness, susceptibility to flooding, density, plasticity, texture, and shrink-swell potential. Those that affect excavation are wetness, slope, depth to bedrock, and content of stones and rocks.

Local roads and streets, as rated in table 7, have an all-weather surface expected to carry automobile traffic all year. They have a subgrade of underlying soil material; a base consisting of gravel, crushed rock, or soil material stabilized with lime or cement; and a flexible or rigid surface, commonly asphalt or concrete. These roads are graded to shed water and have ordinary provisions for drainage. They are built mainly from soil at hand, and most cuts and fills are less than 6 feet deep.

Soil properties that most affect design and construction of roads and streets are load-supporting capacity and stability of the subgrade and the workability and availability of fill material. The AASHO and Unified classifications of the soil material, and also the shrink-swell potential, indicate traffic-supporting capacity. Wetness and flooding affect stability of the material. Slope, depth to hard rock, content of stones and rocks, and wetness affect ease of excavation and amount of cut and fill needed to reach a desired design grade.

Camp areas are used intensively for tents and small camp trailers and the accompanying activities of outdoor living. Little preparation of the site is required other than shaping and leveling for tent and parking areas. Campsites are subject to heavy foot traffic and limited vehicular traffic. The best soils have mild slopes, good drainage, a surface free of rocks and coarse fragments, freedom from flooding during periods of heavy use, and a surface that is firm after rain but not dusty when dry.

Picnic areas are attractive natural or landscaped tracts used primarily for preparing meals and eating outdoors. These areas are subject to heavy foot traffic. Most of the vehicular traffic, however, is confined to access roads. The best soils are firm when wet but not dusty when dry; are free of flooding during the season of use; and do not have slopes or stoniness that greatly increase cost of leveling sites or of building access roads.

Playgrounds are areas used intensively for baseball, football, badminton, and similar organized games. Soils suitable for this use need to withstand intensive foot traffic. The best soils have a nearly level surface free of coarse fragments and rock outcrops, good drainage, freedom from flooding during periods of heavy use, and a surface that is firm after rain but not dusty when dry. If grading and leveling are required, depth to rock is important.

Golf course fairways can be established on sites where the soils vary widely, if the site has a good balance between fairways and rough areas or hazards. The requirements for fairways are affected most by the kinds of soils. A fairway requires well-drained soils, gentle slopes, and a good cover of grass. Also, people must be able to move over the fairway with ease on foot or in a golf cart or other light motor vehicle. The soil properties that most affect the suitability of soils for fairways for golf courses are susceptibility to flooding, wetness, soil texture, permeability, and slope.

Paths and trails are used for local and cross country travel by foot or horseback. Design and layout should require little or no cutting and filling. The best soils are at least moderately well drained, are firm when wet but not dusty when dry, are flooded not more than once during the season of use, have slopes of less than 15 percent, and have few or no rocks or stones on the surface.

Shallow excavations are those that require excavating or trenching to a depth of less than 6 feet; for example, excavations for pipelines, sewer lines, phone and power transmission lines, basements, open ditches, and cemeteries. Desirable soil properties are good workability, moderate resistance to sloughing, gentle slopes, absence of rock outcrops or big stones, and freedom from flooding or a high water table.

Formation and Classification of the Soils

This section discusses the major factors of soil formation and explains the current system of classification. Table 9 gives the classification of each soil series by higher categories according to the current system. The names and classification of the soils in Holmes County were approved in July 1971.

Factors of Soil Formation

Five major factors determine the formation of soils: (1) the type of parent material, (2) the topography, or lay of the land, (3) the plant and animal life in and on the soil, (4) the climate under which the soil formed, and (5) the length of time these factors have acted on the soil material.

Parent material

Parent material is the unconsolidated mass from which a soil forms. It determines the limits of the chemical and mineralogical characteristics of soil. Most of the soils in Holmes County formed in loamy, clayey, or sandy marine deposits. The differences among these soils are determined mainly by the amount and proportions of sand, silt, and clay in the different soil layers and the chemical and mineralogical properties. Some soils formed in recent, water-deposited materials along stream terraces and flood plains. These soils generally have only weakly defined profiles.

Climate

The climate of Holmes County is uniform throughout the county and accounts for few differences among the soils. It is mild and humid with long, warm summers and mild winters. Temperature and rainfall are the major factors of climate that influence soil formation. In Holmes County the average daily maximum temperature is about 79.7° F., and the average daily minimum is about 57.1° F. The rainfall averages about 60 inches each year. For more detailed information about the climate of Holmes County, see the section on climate.

A climate such as that in Holmes County favors the growth of plants and animals and rapid decomposition of organic matter and hastens chemical reactions in the soil. The abundant rainfall leaches soluble bases, plant nutrients, and colloidal materials downward leaving the soil acid and low in natural fertility. Soil development continues the year round because the soils are seldom frozen.

Plant and animal life

Living organisms are important in soil formation. They mix the soil, create pores and channels through which air and water move, provide organic matter, bring plant nutrients from the lower to the upper horizons, and bring about changes in soil structure. Acids released by decomposition of organic matter alter chemical reactions in the soil.

In Holmes County the original vegetation was forest. Pine was dominant on the better drained soils, and hardwoods on the wetter soils. On some soils there was a mixture of pine and hardwoods.

Organic matter from the various plants decomposes rather rapidly because the temperature, moisture content, and micropopulation of the soil are favorable for its decomposition. Most of the soils in this county contain a fairly small amount of organic matter, and this is mainly in the surface horizon. Vegetation has not been a major factor in producing local differences among soils.

Relief

Relief, or topography, influences soil formation through its effect on drainage, erosion, and vegetable cover. In Holmes County the relief is nearly level to sloping uplands that are dissected by many streams and drainageways. Elevation ranges from about 30 feet to 312 feet above sea level.

TABLE 9.—*Classification of series by higher categories*

Series	Family	Subgroup	Order
Albany	Loamy, siliceous, thermic	Grossarenic Paleudults	Ultisols.
Angie	Clayey, mixed, thermic	Aquic Paleudults	Ultisols.
Ardilla	Fine-loamy, siliceous, thermic	Fragiaquic Paleudults	Ultisols.
Bibb	Coarse-loamy, siliceous, acid, thermic	Typic Fluvaquents	Entisols.
Bonifay	Loamy, siliceous, thermic	Grossarenic Plinthic Paleudults	Ultisols.
Chipley	Thermic, coated	Aquic Quartzipsamments	Entisols.
Dothan	Fine-loamy, siliceous, thermic	Plinthic Paleudults	Ultisols.
Faceville [1]	Clayey, kaolinitic, thermic	Typic Paleudults	Ultisols.
Fuquay	Loamy, siliceous, thermic	Arenic Plinthic Paleudults	Ultisols.
Gritney	Clayey, mixed, thermic	Typic Hapludults	Ultisols.
Kenansville	Loamy, siliceous, thermic	Arenic Hapludults	Ultisols.
Lakeland	Thermic, coated	Typic Quartzipsamments	Entisols.
Leefield	Loamy, siliceous, thermic	Arenic Plinthaquic Paleudults	Ultisols.
Lucy	Loamy, siliceous, thermic	Arenic Paleudults	Ultisols.
Maxton	Fine-loamy, siliceous, thermic	Typic Hapludults	Ultisols.
Orangeburg	Fine-loamy, siliceous, thermic	Typic Paleudults	Ultisols.
Pansey	Fine-loamy, siliceous, thermic	Plinthic Paleaquults	Ultisols.
Pantego	Fine-loamy, siliceous, thermic	Umbric Paleaquults	Ultisols.
Plummer	Loamy, siliceous, thermic	Grossarenic Paleaquults	Ultisols.
Stilson	Loamy, siliceous, thermic	Arenic Plinthic Paleudults	Ultisols.
Tifton	Fine-loamy, siliceous, thermic	Plinthic Paleudults	Ultisols.
Troup	Loamy, siliceous, thermic	Grossarenic Paleudults	Ultisols.

[1] The Faceville soils in this county are taxadjuncts to the Faceville series because their clayey subsoil contains a higher percentage of minerals, other than kaolinite, than is defined for the series. This difference does not alter the use and behavior of these soils.

Poorly drained or very poorly drained soils generally are in low, nearly level areas and in depressions. Much water is received as runoff from adjacent areas at higher elevations. Soil formation is retarded by accumulated water. The absence of air in these waterlogged soils results in the reduction of iron in the soil, and soil colors are dominantly gray.

Well-drained upland soils formed on nearly level to sloping ridges and side slopes where excess water is readily drained away. As the slope increases, runoff generally increases in intensity, erosion accelerates, and less water is absorbed to become available for plants. These soils are well aerated and are dominantly yellow, brown, or red in color.

In areas where relief and position are intermediate, moderately well drained and somewhat poorly drained soils are dominant. They have brown or yellow colors and some gray mottles in the subsoil. The gray mottles are indicators of a fluctuating water table.

Time

The length of time required for a soil to form depends mainly on the combined influences of soil-forming factors. If all other soil-forming factors are equal, the degree of soil formation is in direct proportion to time. If soil-forming factors have been active for a long time, soil formation or horizonation is stronger than if the same factors have been active for a relatively short time.

The oldest soils in Holmes County are those on nearly level uplands and gently sloping ridges. These soils formed in old marine deposits and have undergone considerable weathering. They have well-defined horizons.

The next oldest soils in the county are those on the terrace of the Choctawhatchee River that is no longer flooded. These soils have fairly strong formation.

The youngest soils are the alluvial soils along streams. They receive deposits of sediments from the surrounding areas at higher elevations and are constantly accumulating new soil materials. In most places these soils have only weakly defined horizons because of the short period of time soil-forming processes have been active.

Classification of the Soils

Soils are classified so that we can more easily remember their significant characteristics. Classification enables us to assemble knowledge about the soils, to see their relationship to one another and to the whole environment, and to develop principles that help us to understand their behavior and their response to manipulation. First through classification, and then through use of soil maps, we can apply our knowledge of soils to specific fields and other tracts of land.

The narrow categories of classification, such as those used in detailed soil surveys, allow us to organize and apply knowledge about soils in managing farms, fields, and woodlands; in developing rural areas; in engineering work; and in many other ways. Soils are placed in broad classes to facilitate study and comparison in large areas such as countries and continents.

The system of soil classification currently used was adopted by the National Cooperative Soil Survey in 1965 (*6, 9*). Because this system is under continual study, readers interested in developments of the current system should refer to the latest literature available.

The current system of classification has six categories. Beginning with the broadest, these categories are the order, suborder, great group, subgroup, family, and series. In this system the criteria used as a basis for classification are soil properties that are observable and measurable. The properties are chosen, however, so that the soils of similar genesis, or mode of origin, are grouped. In table 9, the soil series of Holmes County are placed in four categories of the current system. Classes of the current system are briefly defined in the following paragraphs.

ORDER.—Ten soil orders are recognized. The properties used to differentiate among soil orders are those that tend to give broad climatic groupings of soils. The two exceptions to this are the Entisols and Histosols, which occur in many different climates. Each order is named with a word of three or four syllables ending in *sol* (Ent-i-sol).

SUBORDER.—Each order is divided into suborders that are based primarily on those soil characteristics that seem to produce classes with the greatest genetic similarity. The suborders narrow the broad climatic range permitted in the orders. The soil properties used to separate suborders are mainly those that reflect either the presence or absence of water-logging, or soil differences resulting from the climate or vegetation. The names of suborders have two syllables. The last syllable indicates the order. An example is *Aquent* (*Aqu*, meaning water or wet, and *ent*, from Entisols).

GREAT GROUP.—Soil suborders are separated into great groups on the basis of uniformity in the kinds and sequence of major soil horizons and features. The horizons used to make separations are those in which clay, iron, or humus have accumulated; those that have pans that interfere with growth of roots, movement of water, or both; and those that have a thick, dark-colored surface layer. The features used are the self-mulching properties of clay, soil temperature, major differences in chemical composition (mainly calcium, magnesium, sodium, and potassium), dark-red and dark-brown colors associated with basic rocks, and the like. The names of great groups have three or four syllables and are made by adding a prefix to the name of the suborder. An example is Fluvaquents (*Fluv*, meaning deposited by flowing water, *aqu* for wetness or water, and *ent*, from Entisols).

SUBGROUP.—Great groups are subdivided into subgroups, one representing the central (typic) segment of the group, and others called intergrades that have properties of the group and also one or more properties of another great group, suborder, or order. Subgroups may also be made in those instances where soil properties intergrade outside of the range of any other great group, suborder, or order. The names of subgroups are derived by placing one or more adjectives before the name of the great group. An example is Typic Fluvaquents (a typical Fluvaquent).

FAMILY.—Soil families are separated within a subgroup primarily on the basis of properties important to the growth of plants or on the behavior of soils when used for engineering. Among the properties considered are texture, mineralogy, reaction, soil temperature, permeability, thickness of horizons, and consistence. A family name consists of a series of adjectives preceding the subgroup name. The adjectives are the class names for texture, mineralogy, and so on, that are used to differentiate families (see table

9). An example is the coarse-loamy, siliceous, acid, thermic family of Typic Fluvaquents.

SERIES.—The series has the narrowest range of characteristics of the categories in the current system. It is described fully in the section "How This Survey Was Made." For a description of each soil series in Holmes County, turn to the section "Descriptions of the Soils."

Physical and Chemical Analyses of Soils [3]

The physical, chemical, and mineralogical properties of four soil series (Dothan, Faceville, Fuquay, and Orangeburg) from Holmes County are given in tables 10 and 11. These analyses were conducted and coordinated by the Soil Characterization Laboratory, Soil Science Department, University of Florida Agricultural Experiment Stations. Detailed descriptions of the soils, including their location, are given in alphabetical order in the section "Descriptions of the Soils."

[3] By F. G. CALHOUN, soil taxonomist, and R. E. CALDWELL, soil chemist, University of Florida Agricultural Experiment Stations, Gainsville, Florida.

In addition to the data presented in tables 10 and 11, the results of laboratory analyses for many other soils identified in Holmes County (profiles sampled in other counties) are on file in the Soil Science Department, University of Florida. Data of this nature are useful in classification, determination of potential productivity, and understanding the genesis of soils.

Laboratory Methods

The majority of the data were obtained by using methods outlined in Soil Survey Investigations Report No. 1 (*10*). Soil samples collected from carefully selected sites were air-dried, rolled or crushed, and sieved through a 2-millimeter screen. Particle-size distribution data were obtained by the hydrometer method (*2*) after dispersion by shaking with sodium hexametaphosphate. The sand fractions were obtained by dry-sieving through a nest of sieves for at least 15 minutes and expressed on an oven-dry weight basis. The percentage of silt was determined by difference. The textures given in the section "Descriptions of the Soils" are field estimates and do not necessarily agree with the laboratory texture shown in the third column of table 10.

TABLE 10.—*Particle-size distribution*

[Analyses by Soil Characterization Laboratory, University of Florida, Gainesville, Florida. Absence of

Soil and sample number	Horizon	Depth from surface	USDA texture	Particle-size distribution			
				Very coarse sand (2–1 mm)	Coarse sand (1–0.5 mm)	Medium sand (0.5–0.25 mm)	Fine sand (0.25–0.1 mm)
		Inches		*Percent*	*Percent*	*Percent*	*Percent*
Dothan loamy sand: S69–Fla30–2 (1–7).	Ap	0–8	Loamy sand	0.9	6.8	25.2	41.0
	B1	8–13	Fine sandy loam	1.6	8.9	20.3	32.0
	B21t	13–30	Fine sandy loam	1.3	7.9	20.3	32.8
	B22t	30–40	Sandy clay loam	1.6	8.0	21.0	29.4
	B23t	40–52	Sandy clay loam	2.3	8.8	22.4	25.9
	B24t	52–61	Sandy clay loam	1.9	18.0	31.9	9.9
	B3t	61–67	Sandy clay loam	4.1	18.0	28.8	10.7
Faceville sandy loam: S69–Fla30–3 (1–6).	Ap	0–6	Sandy loam	1.3	5.1	18.6	33.1
	B1t	6–9	Sandy clay loam	1.7	6.7	16.0	26.4
	B21t	9–21	Sandy clay	2.1	6.3	13.6	20.0
	B22t	21–43	Clay	1.4	6.2	10.3	12.3
	B23t	43–61	Clay	1.7	5.3	11.4	15.5
	B3t	61–65	Clay	.9	4.7	9.0	11.4
Fuquay loamy sand: S69–Fla30–6 (1–6).	Ap	0–6	Loamy sand	2.3	13.2	29.4	30.1
	A21	6–13	Loamy sand	2.5	12.3	27.7	30.0
	A22	13–33	Loamy sand	2.9	12.5	25.0	29.6
	B1t	33–45	Sandy loam	3.5	13.5	25.5	28.5
	B21t	45–57	Sandy clay loam	3.7	13.1	22.3	25.4
	B22t	57–88	Sandy clay loam	3.5	14.4	21.9	21.1
Orangeburg loamy sand: S69–Fla30–5 (1–6).	A1	0–5	Loamy sand	1.3	4.7	10.4	40.2
	A2	5–10	Fine sandy loam	1.2	4.3	9.5	36.7
	B1t	10–17	Fine sandy loam	1.2	4.0	9.5	35.5
	B21t	17–21	Sandy clay loam	1.3	4.3	8.8	31.7
	B22t	21–54	Sandy clay loam	1.7	4.5	7.3	32.9
	B22t	54–108	Sandy clay loam	1.5	4.5	7.8	31.6

Measurements of soil reaction (pH) were made by procedure 8C1 using a glass electrode (*10*). Extractable bases were obtained by leaching a soil sample with amonium acetate buffered at pH 7.0 as outlined in procedure 5B1 (*10*). These cations were then determined separately through the use of a Beckman DU flame spectrophotometer. Titratable acidity, which was determined instead of extractable acidity, 6H2 (*10*), was measured by potentiometric titrations with 0.05 *N* barium hydroxide using a Sargent Model D Recording Titrator after mixing 10 grams of soil in 50 millimeters of neutral 1 *N* KC1 (*13*). Titratable acidity may be somewhat lower than extractable acidity, which is used in definitions of some soil taxonomic units. However, in data presented, this would not alter the classification. Cation exchange capacity was calculated by summing the exchangeable bases and titratable acidity. Base saturation was derived by dividing the sum of exchangeable bases by the cation exchange capacity and then multiplying by 100. Exchangeable aluminum values were obtained from inflection points on the previously mentioned $Ba(OH)_2$ potentiometric titration curves (*13*).

The content of organic matter was determined by a modification of the Walkley-Black wet-combustion method as outlined in procedure 6A1a (*10*). Total nitrogen was obtained by the semi-micro Kjeldahl method was shown in procedure 6B2a (*10*). Corrosion potentials were determined using a Model 100 Corrosion Tester. Corrosion resistance is in ohms and corrosion potential is in pipe life. The smaller the potential, the less the corrosion and the greater the expectancy of pipe life. Generally, values range from 1 to 10 with pipe life ranging from 20 years to 2 years, respectively.

Bulk density, saturated hydraulic conductivity, and water retention at 0.33 bar were measured on 3 x 5.4 centimeter cylindrical (undisturbed) soil cores. Water retention at 15 bars suction was determined on disturbed or loose soil samples by procedure 4B2 (*10*). The water retention difference, calculated by procedure 4C1 (*10*), is the differences between the water retained at 0.33 bar and that at 15 bar suction, multiplied by the bulk density.

Clay minerals were identified by X-ray diffraction and differential thermal analysis. A General Electric XRD-700 X-ray diffraction instrument was used. Radiation was detected with a proportional counter. Diffractograms of treated clays were obtained by procedures outlined under code no. 7A (*10*). Differential thermograms of soil clays were made using the Deltatherm Model D200 as described by Reneau and Carlisle (*5*).

and mineralogy of selected soils

data indicates determination was not made. The symbol < means less than; the symbol > means more than]

Particle-size distribution—Continued			Mineral content of clay fraction (less than 0.002 mm)							
Very fine sand (0.1–0.05 mm)	Silt (0.05–0.002 mm)	Clay (<0.002 mm)	Vermiculite	Kaolinite	Quartz	Gibbsite	Feldspar	Goethite	Mica	Intergrade vermiculite-mica
Percent	*Percent*	*Percent*	*Percent*	*Percent*	*Percent*	*Percent*	*Percent*	*Percent*	*Percent*	*Percent*
13.0	8.4	4.7	---	---	---	---	---	---	---	---
10.2	8.8	18.0	>40	>40	<10	<10	---	---	---	---
10.7	9.6	17.4	>40	>40	<10	10–40	---	---	---	---
8.8	8.4	22.8	>40	>40	<10	10–40	---	---	---	---
6.8	7.4	26.4	---	---	---	---	---	---	---	---
2.1	3.9	32.4	10–40	>40	<10	<10	---	---	---	---
2.4	3.6	32.4	<10	>40	<10	---	---	---	---	---
13.7	14.4	13.8	>40	>40	<10	10–40	<10	---	---	---
12.2	8.8	28.2	>40	>40	<10	10–40	<10	---	---	---
8.8	7.6	41.6	>40	>40	<10	<10	<10	---	---	---
5.8	9.2	53.8	<10	>40	<10	<10	---	---	---	---
6.5	9.4	50.2	---	---	---	---	---	---	---	---
5.0	12.2	56.8	<10	>40	<10	<10	---	---	10–40	10–40
8.3	10.8	5.9	>40	>40	<10	10–40	---	---	---	---
8.4	10.6	8.5	---	---	---	---	---	---	---	---
9.1	8.3	10.6	---	---	---	---	---	---	---	---
8.2	8.4	12.4	>40	10–40	<10	10–40	<10	---	---	---
7.1	7.4	21.0	---	---	---	---	---	---	---	---
5.1	7.0	27.0	10–40	>40	<10	10–40	---	<10	---	---
24.5	11.8	7.1	>40	>40	<10	10–40	---	---	---	---
22.3	11.9	14.1	---	---	---	---	---	---	---	---
23.0	11.4	15.4	>40	>40	<10	10–40	---	---	---	---
21.7	10.0	22.2	---	---	---	---	---	---	---	---
20.4	8.0	25.2	---	---	---	---	---	---	---	---
25.0	6.4	23.2	>40	>40	<10	10–40	---	<10	---	---

General Nature of the County

Farming and timber products are the major enterprises in Holmes County. In 1969, there were 737 commercial farms and the average size of each farm was 177.6 acres. The Conservation Needs Inventory of 1967 (*3*) showed 67,945 acres of cropland, 38,660 acres of pasture, and 190,800 acres of woodland. The remaining 4,698 acres consisted of urban built-up land, small water areas, and Federal noncropland.

The main crops are peanuts, corn, watermelons, small grains, and pasture grasses. The woodland is mainly longleaf and slash pines on the uplands and cypress, birch, tupelo, poplar, sweetgum, bay, and magnolia in the swamps, on the bottom lands, and along the Choctawhatchee River. The timberland can be reforested rapidly because of the favorable climate, and three sawmills and flour pulpmills operate in the county (*4*).

The livestock and produce markets near Bonifay are serviced by trucks. The improvement of pastures and the introduction of better breeding stock have bolstered the livestock resources in recent years. The county now has approximately 260 beef-cattle herds and 13 commercial dairy farms (*4*).

Holmes County has a well-maintained system of Federal and State highways that provide easy access to all major cities in Florida, Alabama, and Georgia. U.S. Highway 90 passes through Bonifay and the southern part of the county. Bonifay is served by several trucking companies from nearby cities and a main line of the Louisville and Nashville Railroad.

Physiography and Drainage

Holmes County lies within the Coastal Plain province, a major physiographic division of the United States. The Coastal Plain is a broad belt consisting mainly of unconsolidated sand, silt, and clay that were deposited primarily by sea water before the shoreline of the continental United States reached its present position. These are terraces of Pliocene and Pleistocene Age. The rest of the county is made up of soils from formations of Eocene, Oligocene, and Miocene Age (*12*). These formations, from oldest to youngest, are the Ocala Limestone, Mariana Limestone, Suwannee Limestone, Tampa Limestone, and Alum Bluff Formation. These formations dip to the south at approximately 20 feet per mile.

Holmes County has a well-defined branching or dendritic drainage system. The large creeks are shallow and

TABLE 11.—*Chemical analyses and certain*

[Analyzed by Soil Characterization Laboratory, University of Florida,

Soil name and sample number	Horizon	Depth from surface	Reaction			Extractable bases			
			H_2O 1:1	0.01M $CaCl_2$ 1:2	1N KCl 1:1	Calcium	Magnesium	Sodium	Potassium
		Inches	*pH*	*pH*	*pH*	*Meq per 100 gm of soil*	*Meq per 100 gm of soil*	*Meq per 100 gm of soil*	*Meq per 100 gm of soil*
Dothan loamy sand: S69–Fla30–2 (1–7).	Ap	0–8	5.2	4.5	4.2	0.3	0.0	0.0	0.1
	B1	8–13	4.8	4.4	3.8	.2	.1	0	0
	B21t	13–30	5.0	4.2	4.2	.2	0	0	.1
	B22t	30–40	5.1	4.5	4.2	.8	.1	0	.1
	B23t	40–52	5.2	4.3	4.1	.3	.1	0	.1
	B24t	52–61	5.1	4.1	4.0	.8	.1	.1	0
	B3t	61–67	----------	4.1	----------	.1	.1	.1	0
Faceville sandy loam: S69–Fla30–3 (1–6).	Ap	0–6	5.2	4.6	4.2	.9	.2	0	.2
	B1t	6–9	4.8	4.4	3.8	.7	.2	0	.1
	B21t	9–21	5.0	4.8	4.2	1.0	.4	0	.1
	B22t	21–43	5.1	4.7	4.2	.8	.5	0	.1
	B23t	43–61	5.2	4.6	4.1	.4	.4	0	.1
	B3t	61–65	5.1	4.6	4.0	.4	.5	0	.2
Fuquay loamy sand: S69–Fla30–6 (1–6).	Ap	0–6	5.4	4.9	4.5	.7	.2	0	.1
	A21	6–13	5.2	4.5	4.0	.3	.1	0	0
	A22	13–33	5.0	4.3	3.9	.3	.1	0	0
	B1t	33–45	5.0	4.4	3.9	.4	.1	.1	0
	B21t	45–57	4.8	4.3	3.8	.3	.1	0	0
	B22t	57–88	5.0	4.4	3.0	.1	.2	0	0
Orangeburg loamy sand: S69–Fla30–5 (1–7).	A1	0–5	5.1	4.8	4.3	.6	.2	0	.1
	A2	5–10	5.2	4.7	4.1	.2	.2	0	0
	B1t	10–17	5.2	4.7	4.0	.2	.2	0	0
	B21t	17–21	5.2	4.7	4.0	.6	.2	0	0
	B22t	21–54	5.2	4.5	3.9	.5	.4	0	0
	B23t	54–108	5.1	4.3	3.8	.1	.1	0	0
	B3t	108–150	5.1	4.3	3.8	.1	.1	0	0

meander slowly through wide bottom-land areas. The smaller intermittent streams dissect the upland ridges and receive drainage water from these areas at higher elevations. The smaller streams generally flow in a southerly direction to the larger streams. The Choctawhatchee River flows to the south through the center of the county; the larger creeks empty into it.

The drainage system in a few areas of the southern part of the county is not well defined. These areas consist of large depressions that have poorly defined outlets and are ponded for long periods.

Water Supply and Natural Resources

Holmes County has many perennial streams, flowing springs, lakes, and ponds. Many of these are used for livestock, and they are well distributed throughout the county. Many rural and farm homes have privately owned deep wells. Some of these are of the artesian type and range from 100 to several hundred feet deep. An adequate supply of water for residential and industrial use is supplied by the city of Bonifay from an artesian well that is 600 feet deep (*4*). This well produces 250 gallons per minute.

Other natural resources of the county consist of deposits of lime, sand, and clay. Preliminary analysis of lime shows that it is suitable for agricultural and road building uses. Numerous sand deposits are located and found to be suitable for construction materials and sand-blasting. A few small clay deposits that occur in the county can be used in structural clay products and pottery (*7*). These deposits are of high-quality material but are of limited quantity.

Climate[4]

The climate of Holmes County is characterized by long, warm summers and mild winters. Rainfall is abundant and, on the average, is reasonably well distributed throughout the year. Summarized climatic data, taken from the records of stations immediately adjacent to the county, are shown in table 12.

The Gulf of Mexico is largely responsible for the mild, moist climate, although the proximity of the great North American land mass gives this part of the State a slightly more continental climate and greater temperature extremes than are encountered in peninsular Florida. Temperatures

[4] By JAMES T. BRADLEY, climatologist for Florida, National Weather Service, U.S. Department of Commerce.

physical properties of selected soils

Gainesville, Florida. Absence of data indicates determination was not made]

Titratable acidity	Cation exchange capacity	Exchangeable aluminum	Base saturation	Organic matter	Total nitrogen	Corrosion		Bulk density	Saturated hydraulic conductivity	Water retention difference	Water content at—	
						Resistance	Potential				0.33 bar	15 bars
			Percent	*Percent*	*Percent*	*Ohms*	*Ohms*	*Gm per cm³*	*Cm per hr*	*In per in*	*Percent*	*Per cent*
0.5	0.9	0.0	44	1.6	0.4	1.6	0.2	1.68	19.5	0.04	4.5	2.0
1.7	2.0	.6	15	.8	0	1.5	.2	1.63	13.2	.07	9.6	5.2
2.4	2.7	.9	11	.2	0	1.8	.3	1.70	6.3	.09	11.6	6.1
2.3	3.3	.6	30	.1	0	1.6	.1	1.66	3.9	.10	14.9	9.1
3.2	3.7	1.1	14	.1	0	.7	.1	1.68	1.5	.08	14.9	10.0
4.8	5.8	2.7	17	0	0	.9	.1	--------	--------	--------	--------	--------
5.5	5.8	3.3	5	.1	0	1.4	.1	--------	--------	--------	--------	--------
1.2	2.5	--------	52	1.3	.1	2.1	.3	--------	--------	--------	--------	--------
2.9	3.9	--------	26	.6	0	2.2	.3	--------	--------	--------	--------	--------
3.1	4.6	--------	33	.3	0	1.7	.1	--------	--------	--------	--------	--------
3.5	4.9	--------	29	.3	0	.5	.1	1.63	2.9	.06	20.7	16.7
5.0	5.9	--------	15	.1	0	.7	.1	--------	--------	--------	--------	--------
4.9	6.0	--------	18	.1	0	.8	.1	--------	--------	--------	--------	--------
.5	1.5	0	67	1.4	0	2.0	.2	1.48	33.3	.04	4.9	2.4
1.0	1.4	.3	29	.4	0	1.1	.2	--------	--------	--------	--------	--------
1.5	1.9	.5	21	.2	0	.9	.1	1.53	46.5	.04	5.9	3.2
1.5	2.1	.5	29	.1	0	1.1	.2	1.58	20.8	.06	8.9	4.8
2.9	3.3	.7	12	.2	0	1.0	.1	1.59	--------	.06	11.9	7.9
2.6	2.9	.5	10	.1	0	.6	.1	--------	--------	--------	--------	--------
.9	1.8	--------	50	1.8	.1	2.6	.4	1.60	7.4	.07	6.6	2.1
1.9	2.3	.2	17	.5	0	1.0	.2	--------	--------	--------	--------	--------
2.2	2.6	.2	15	.3	0	.8	.1	1.62	4.7	.08	9.9	5.2
2.9	3.7	.4	22	.2	0	.5	.1	--------	--------	--------	--------	--------
2.9	3.8	.6	24	.1	0	.5	.1	1.59	3.3	.09	14.3	8.8
3.3	3.5	1.2	6	0	0	.4	.1	1.65	--------	.09	14.3	9.0
3.3	3.5	1.0	6	.1	0	.5	.1	--------	--------	--------	--------	--------

TABLE 12.—*Temperature and precipitation data*

[Based on data recorded at De Funiak Springs, Marianna, and Caryville, Florida, during the 30-year period 1931 through 1960]

Month	Temperature				Precipitation				
	Average daily maximum	Average daily minimum	Two years in 10 will have at least 4 days with— Maximum temperature equal to or higher than—	Two years in 10 will have at least 4 days with— Minimum temperature equal to or lower than—	Average total	One year in 10 will have— Less than—	One year in 10 will have— More than—	Average number of days with rainfall of 0.10 inch or more	Average number of days with rainfall of 0.50 inch or more
	°F	°F	°F	°F	Inches	Inches	Inches		
January	65.4	43.6	79	27	4.15	1.2	7.0	6	3
February	67.8	45.5	80	30	4.34	1.4	6.7	6	3
March	73.2	49.3	84	35	6.02	2.6	10.2	6	4
April	80.4	56.0	88	43	5.30	2.0	10.0	6	3
May	87.3	63.2	93	52	4.54	1.4	8.2	6	3
June	91.5	64.3	97	63	5.12	1.6	8.5	8	4
July	91.6	71.2	97	68	8.38	4.0	12.5	12	6
August	91.5	71.1	95	67	7.08	3.3	11.0	10	5
September	88.4	67.6	94	59	5.52	1.6	10.5	7	3
October	81.7	57.4	89	43	2.20	0.2	4.5	3	1
November	71.6	47.0	83	32	3.20	0.4	6.4	4	2
December	65.5	43.5	78	28	4.32	1.6	7.7	6	3
Year	79.7	57.1			60.17			80	40

during the summer months, June through mid-September, show little day-to-day variation and range from early morning minimums near 70° F. to afternoon highs in the low nineties. Although temperatures reach 90° or higher with great regularity in summer (averaging about 90 days per year), temperatures of 100° or higher generally occur only once or twice a year.

Fall is a pleasant season of transition. Warm summery weather persists until early in October. Extremes in temperatures are rare. Temperatures during the winter months, December through February, display considerable day-to-day variation and range from the high forties on the colder days to the low seventies on the warmer days. Freezing temperatures occur on an average of 20 days every winter, and every winter has some freezing temperatures.

Records indicate the average dates of the first 32° freeze in fall and the last 32° freeze in spring are about November 20 and March 1, respectively. Temperatures of 20° or lower can be expected at least once during the winter. in about 50 percent of the years. Temperatures as low as 10° are rare, and records indicate that temperatures this low occur only about once in every 25 years. The lowest temperature on record for this part of Florida is 0°, and this was observed at De Funiak Springs on February 13, 1899.

Cold spells in winter are generally 2 to 4 days in duration, and even on the colder days temperatures almost always rise above freezing. Spring is a period of warm temperatures and relatively high rainfall. March is typically windy; the average windspeed in March is 10 miles per hour.

Precipitation varies greatly for any one month from year to year. On the basis of average monthly totals, there are two relatively high rainfall periods during the year. One is around March and early April, and the other is from about mid-June through mid-September. October and November commonly are the driest months. Most of the rainfall in summer comes from local afternoon or evening showers and thundershowers. Thundershowers occur in all seasons, averaging about 70 per year, but nearly 75 percent of the thunderstorms occur in summer. During June, July, and August, measurable rainfall can be expected on about 50 percent of the days. Summer showers are occasionally heavy and 2 or 3 inches of rain fall in an hour or two. Daylong summer rains are rare, and when they do occur, they are almost always associated with tropical storms or hurricanes.

The winter or early spring rains generally occur as a result of large-scale weather developments and tend to be of longer duration and more widespread. Excessive and flood-producing rains occur ocassionally; 24-hour rainfall totals in excess of 8 inches can be expected to occur in about 10 percent of the years.

Nearly all the precipitation in Holmes County falls as rain. Hail is observed at irregular intervals but is almost always associated with spring and early summer thundershowers. Snowfall is a rarity, but measurable amounts have been noted on several occasions during the past 50 years. It is extremely rare for snow to remain on the ground for more than 24 hours.

For planting and harvesting reasons, it is important to know as nearly as possible the latest date of damaging low temperatures in spring and the earliest in fall. Table 13 gives probabilities of temperature of 32° and 28° for various dates in spring and fall.

Damaging droughts occasionally occur, even though rainfall distribution is generally good in Holmes County. By definition, a drought occurs when the soil does not have enough available water for plants to maintain normal growth. Consequently, within a normal year there are

periods when rainfall does not supply as much water as is needed by most crops. Therefore, supplementary irrigation is needed in most years for maximum crop production. These droughts may occur in any season, but usually they are in October and November, or April, May, and June. Table 14 shows drought probabilities calculated for Quincy, Florida.

Tropical storms or hurricanes, which can generally occur early in June through early in November, have affected this area in about 33 percent of the last 50 years. Since these storms rapidly diminish in intensity as they move inland from the Gulf of Mexico, winds of hurricane force (75 miles per hour or greater) are rarely observed in Holmes County. The major effects of these storms are prolonged and widespread rainfall and persistent surface winds. Winds seldom exceed 60 miles per hour in the county during the passage of one of these storms. Tornadoes have been reported in this part of Florida, but the frequency and the areas affected by these storms are very small compared to the storms observed in the Great Plains and Middle West of the United States.

Prevailing winds in this area are generally southerly in summer and northerly in winter. Windspeed by day usually ranges between 8 and 15 miles per hour but nearly always drops below 8 miles per hour at night.

TABLE 13.—*Probabilities of damaging low temperatures in spring and fall*

[Based on records from 1925 through 1961 at De Funiak Springs in Walton County]

Probability	Dates for given probability and temperature—	
	32° F.	28° F.
Spring:		
1 year in 10 later than	March 26	March 13
2 years in 10 later than	March 17	March 3
3 years in 10 later than	March 11	February 24
4 years in 10 later than	March 5	February 18
5 years in 10 later than	February 28	February 13
6 years in 10 later than	February 23	February 8
7 years in 10 later than	February 18	January 31
8 years in 10 later than	February 11	January 23
9 years in 10 later than	February 2	January 13
Fall:		
1 year in 10 earlier than	November 4	November 17
2 years in 10 earlier than	November 10	November 21
3 years in 10 earlier than	November 14	November 25
4 years in 10 earlier than	November 18	November 29
5 years in 10 earlier than	November 21	December 3
6 years in 10 earlier than	November 25	December 10
7 years in 10 earlier than	November 29	December 20
8 years in 10 earlier than	December 3	December 30
9 years in 10 earlier than	December 9	January 10

TABLE 14.—*Probabilities of occurrence of dry periods of given length*

[Data based on determinations made for the North Florida Experiment Station at Quincy. A dry period is defined as a set of consecutive days, each of which has less than 0.20 inch of precipitation. > means greater than; < means less than]

Duration of dry period	Probability of occurrence in—		
	Fall	Spring	Entire year
	Pct	*Pct*	*Pct*
10 to 14 days	>99	>99	>99
15 to 19 days	97	90	>99
20 to 24 days	84	64	96
25 to 29 days	65	39	84
30 to 34 days	45	21	63
35 to 39 days	29	10	43
40 to 44 days	18	5	27
45 to 49 days	10	2	16
50 to 54 days	6	1	9
55 to 59 days	3	<1	5
60 days or more	2	<1	3

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Glossary

Alluvium. Soil material, such as sand, silt, or clay, that has been deposited on land by streams.

Available water capacity (also termed available moisture capacity). The capacity of soils to hold water available for use by most

plants. It is commonly defined as the difference between the amount of soil water at field capacity and the amount at wilting point. It is commonly expressed as inches of water per inch of soil.

Clay. As a soil separate, the mineral soil particles less than 0.002 millimeter in diameter. As a soil textural class, soil material that is 40 percent or more clay, less than 45 percent sand, and less than 40 percent silt.

Clay film. A thin coating of clay on the surface of a soil aggregate. Synonyms: clay coating.

Concretions. Grains, pellets, or nodules of various sizes, shapes, and colors consisting of concentrations of compounds, or of soil grains cemented together. The composition of some concretions is unlike that of the surrounding soil. Calcium carbonate and ironstone are examples of material commonly found in concretions.

Consistence, soil. The feel of the soil and the ease with which a lump can be crushed by the fingers. Terms commonly used to describe consistence are—

Loose.—Noncoherent when dry or moist; does not hold together in a mass.

Friable.—When moist, crushes easily under gentle pressure between thumb and forefinger and can be pressed together into a lump.

Firm.—When moist, crushes under moderate pressure between thumb and forefinger, but resistance is distinctly noticeable.

Plastic.—When wet, readily deformed by moderate pressure but can be pressed into a lump; will form a "wire" when rolled between thumb and forefinger.

Sticky.—When wet, adheres to other material and tends to stretch somewhat and pull apart rather than to pull free from other material.

Hard.—When dry, moderately resistant to pressure; can be broken with difficulty between thumb and forefinger.

Soft.—When dry, breaks into powder or individual grains under very slight pressure.

Cemented.—Hard and brittle; little affected by moistening.

Drainage class (natural). Drainage that existed during the development of the soil, as opposed to altered drainage, which is commonly the result of artificial drainage or irrigation but may be caused by the sudden deepening of channels or the blocking of drainage outlets. Seven different classes of natural soil drainage are recognized.

Excessively drained soils are commonly very porous and rapidly permeable and have a low water-holding capacity.

Somewhat excessively drained soils are also very permeable and and are free from mottling throughout their profile.

Well-drained soils are nearly free from mottling and are commonly of intermediate texture.

Moderately well drained soils commonly have a slowly permeable layer in or immediately beneath the solum. They have uniform color in the A horizon and upper part of the B horizon and have mottling in the lower part of the B horizon and in the C horizon.

Somewhat poorly drained soils are wet for significant periods but not all the time, and some soils commonly have mottling at a depth below 6 to 16 inches.

Poorly drained soils are wet for long periods; they are light gray and generally mottled from the surface downward, but some have few or no mottles.

Very poorly drained soils are wet nearly all the time. They have a dark-gray or black surface layer and are gray or light gray, with or without mottling, in the deeper parts of the profile.

Diversion, or diversion terrace. A ridge of earth, generally a terrace, that is built to divert runoff from its natural course and thus to protect areas downslope from the effects of such runoff.

Fertility, soil. The quality of a soil that enables it to provide compounds, in adequate amounts and in proper balance, for the growth of specified plants, when other growth factors such as light, moisture, temperature, and the physical condition of the soil are favorable.

Field moisture capacity. The moisture content of a soil, expressed as a percentage of the oven-dry weight, after the gravitational, or free, water has been allowed to drain away; the field moisture content 2 or 3 days after a soaking rain; also called *normal field capacity, normal moisture capacity,* or *capillary capacity.*

Flood plain. Nearly level land, consisting of stream sediments, that borders a stream and is subject to flooding unless protected artificially.

Fragipan. A loamy, brittle, subsurface horizon that is very low in organic-matter content and clay but is rich in silt or very fine sand. The layer is seemingly cemented. When dry, it is hard or very hard and has a high bulk density in comparison with the horizon or horizons above it. When moist, the fragipan tends to rupture suddenly if pressure is applied, rather than to deform slowly. The layer is generally mottled, is slowly or very slowly permeable to water, and has few or many bleached fracture planes that form polygons. Fragipans are a few inches to several feet thick; they generally occur below the B horizon, 15 to 40 inches below the surface.

Horizon, soil. A layer of soil, approximately parallel to the surface, that has distinct characteristics produced by soil-forming processes. These are the major horizons:

O horizon.—The layer of organic matter on the surface of a mineral soil. This layer consists of decaying plant residues.

A horizon.—The mineral horizon at the surface or just below an O horizon. This horizon is the one in which living organisms are most active and therefore is marked by the accumulation of humus. The horizon may have lost one or more of soluble salts, clay, and sesquioxides (iron and aluminum oxides).

B horizon.—The mineral horizon below an A horizon. The B horizon is in part a layer of change from the overlying A to the underlying C horizon. The B horizon also has distinctive characteristics caused (1) by accumulation of clay, sesquioxides, humus, or some combination of these; (2) by prismatic or blocky structure; (3) by redder or stronger colors than the A horizon; or (4) by some combination of these. Combined A and B horizons are usually called the solum, or true soil. If a soil lacks a B horizon, the A horizon alone is the solum.

C horizon.—The weathered rock material immediately beneath the solum. In most soils this material is presumed to be like that from which the overlying horizons were formed. If the material is known to be different from that in the solum, a Roman numeral precedes the letter C.

R layer.—Consolidated rock beneath the soil. The rock usually underlies a C horizon but may be immediately beneath an A or B horizon.

Irrigation. Application of water to soils to assist in production of crops. Methods of irrigation are—

Border.—Water is applied at the upper end of a strip in which the lateral flow of water is controlled by small earth ridges called border dikes, or borders.

Basin.—Water is applied rapidly to relatively level plots surrounded by levees or dikes.

Controlled flooding.—Water is released at intervals from closely spaced field ditches and distributed uniformly over the field.

Corrugation.—Water is applied to small, closely spaced furrows or ditches in fields of close-growing crops, or in orchards, to confine the flow of water to one direction.

Furrow.—Water is applied in small ditches made by cultivation implements used for tree and row crops.

Sprinkler.—Water is sprayed over the soil surface through pipes or nozzles from a pressure system.

Subirrigation.—Water is applied in open ditches or tile lines until the water table is raised enough to wet the soil.

Wild flooding.—Irrigation water, released at high points, flows onto the field without controlled distribution.

Leaching. The removal of soluble materials from soils or other material by percolating water.

Mottling, soil. Irregularly marked with spots of different colors that vary in number and size. Mottling in soils usually indicates poor aeration and lack of drainage. Descriptive terms are as follows: Abundance—*few, common,* and *many;* size—*fine, medium,* and *coarse;* and contrast—*faint, distinct,* and *prominent.* The size measurements are these: *fine,* less than 5 millimeters (about 0.2 inch) in diameter along the greatest dimension: *medium,* ranging from 5 millimeters to 15 millimeters (about 0.2 to 0.6 inch) in diameter along the greatest dimension; and *coarse,* more than 15 millimeters (about 0.6 inch) in diameter along the greatest dimension.

Munsell notation. A system for designating color by degrees of the three simple variables—hue, value, and chroma. For example,

a notation of 10YR 6/4 is a color with a hue of 10YR, a value of 6, and a chroma of 4.

Organic matter. A general term for plant and animal material, in or on the soil, in all stages of decomposition. Readily decomposed organic matter is often distinguished from the more stable forms that are past the stage of rapid decomposition.

Parent material. Disintegrated and partly weathered rock from which soil has formed.

Permeability. The quality that enables the soil to transmit water or air. Terms used to describe permeability are as follows: *very slow, slow, moderately slow, moderate, moderately rapid, rapid,* and *very rapid.*

Plinthite. The sesquioxide-rich, humus-poor, highly weathered mixture of clay with quartz and other dilutents that commonly shows as red mottles, usually in platy, polygonal, or reticulate patterns. Plinthite changes irreversibly to hardpan or to irregular aggregates upon repeated wetting and drying, or it is hardened relicts of the soft, red mottles. It is a form of laterite.

Plowpan. A compacted layer formed in the soil immediately below the plowed layer.

Poorly graded. A soil material consisting mainly of particles of nearly the same size. Because there is little difference in size of the particles in poorly graded soil material, density can be increased only slightly by compaction.

Profile, soil. A vertical section of the soil through all its horizons and extending into the parent material.

Reaction, soil. The degree of acidity or alkalinity of a soil, expressed in pH values. A soil that tests to pH 7.0 is precisely neutral in reaction because it is neither acid nor alkaline. In words, the degrees of acidity or alkalinity are expressed thus:

	pH		*pH*
Extremely acid	Below 4.5	Neutral	6.6 to 7.3
Very strongly acid	4.5 to 5.0	Mildly alkaline	7.4 to 7.8
Strongly acid	5.1 to 5.5	Moderately alkaline	7.9 to 8.4
Medium acid	5.6 to 6.0	Strongly alkaline	8.5 to 9.0
Slightly acid	6.1 to 6.5	Very strongly alkaline	9.1 and higher

Sand. As a soil separate, individual rock or mineral fragments that range from 0.05 to 2.0 millimeters in diameter. Most sand grains consist of quartz, but the sand may be of any mineral composition. As a textural class soil that is 85 percent or more sand and not more than 10 percent clay.

Silt. As a soil separate, individual mineral particles that range in diameter from the upper limit of clay (0.002 millimeter) to the lower limit of very fine sand (0.05 millimeter). As a textural class, soil that is 80 percent or more silt and less than 12 percent clay.

Soil. A natural, three-dimensional body on the earth's surface that supports plants and that has properties resulting from the integrated effect of climate and living matter acting on earthy parent material, as conditioned by relief over periods of time.

Soil separates. Mineral particles, less than 2 millimeters in equivalent diameter and ranging between specified size limits. The names and sizes of separates recognized in the United States are as follows: *Very coarse sand* (2.0 to 1.0 millimeter); *coarse sand* (1.0 to 0.5 millimeter); *medium sand* (0.5 to 0.25 millimeter); *fine sand* (0.25 to 0.10 millimeter); *very fine sand* (0.10 to 0.05 millimeter); *silt* (0.05 to 0.002 millimeter); and *clay* (less than 0.002 millimeter). The separates recognized by the International Society of Soil Science are as follows: I (2.0 to 0.2 millimeter); II (0.2 to 0.02 millimeter); III (0.02 to 0.002 millimeter); and IV (less than 0.0002 millimeter).

Structure, soil. The arrangement of primary soil particles into compound particles or clusters that are separated from adjoining aggregates and have properties unlike those of an equal mass of unaggregated primary soil particles. The principal forms of soil structure are—*platy* (laminated), *prismatic* (vertical axis of aggregates longer than horizontal), *columnar* (prisms with rounded tops), *blocky* (angular or subangular), and *granular. Structureless* soils are either *single grain* (each grain by itself, as in dune sand) or *massive* (the particles adhering together without any regular cleavage, as in many claypans and hardpans).

Subsoil. Technically, the B horizon; roughly, the part of the solum below plow depth.

Surface soil. The soil ordinarily moved in tillage, or its equivalent in uncultivated soil, about 5 to 8 inches in thickness. The plowed layer.

Terrace. An embankment, or ridge, constructed across sloping soils on the contour or at a slight angle to the contour. The terrace intercepts surface runoff so that it may soak into the soil or flow slowly to a prepared outlet without harm. Terraces in fields are generally built so they can be farmed. Terraces intended mainly for drainage have a deep channel that is maintained in permanent sod.

Terrace (geological). An old alluvial plain, ordinarily flat or undulating, bordering a river, lake, or the sea. Stream terraces are frequently called second bottoms, as contrasted to flood plains, and are seldom subject to overthrow. Marine terraces were deposited by the sea and are generally wide.

Texture, soil. The relative proportions of sand, silt, and clay particles in a mass of soil. The basic textural classes, in order of increasing proportion of fine particles, are *sand, loamy sand, sandy loam, loam, silt loam, silt, sandy clay loam, clay loam, silty clay loam, sandy clay, silty clay,* and *clay.* The sand, loamy sand, and sandy loam classes may be further divided by specifying "coarse," "fine," or "very fine."

Tilth, soil. The condition of the soil in relation to the growth of plants, especially soil structure. Good tilth refers to the friable state and is associated with high noncapillary porosity and stable, granular structure. A soil in poor tilth is nonfriable, hard, nonaggregated, and difficult to till.

Topsoil. A presumed fertile soil or soil material, or one that responds to fertilization, ordinarily rich in organic matter, used to topdress roadbanks, lawns, and gardens.

Water table. The highest part of the soil or underlying rock material that is wholly saturated with water. In some places an upper, or perched, water table may be separated from a lower one by a dry zone.

Well-graded soil. A soil or soil material consisting of particles that are well distributed over a wide range in size or diameter. Such a soil normally can be easily increased in density and bearing properties by compaction. Contrasts with poorly graded soil.

Wilting point (or permanent wilting point). The moisture content of soil, on an oven-dry basis, at which plants (specifically sunflower) wilt so much that they do not recover when placed in a dark, humid atmosphere.

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GUIDE TO MAPPING UNITS

For a full description of a mapping unit, read both the description of the mapping unit and that of the soil series to which the mapping unit belongs. A discussion of the capability classification begins on page 26. Other information is given in tables as follows:

Acreage and extent, table 1, page 5.
Predicted yields, table 2, page 28.
Woodland groups, table 3, page 30.
Suitability for wildlife habitat, table 4, page 34.
Engineering uses of the soils, tables 5, 6, and 7, pages 34 through 45.
Recreational development, table 8, page 46.

Map symbol	Mapping unit	Described on page	Capability unit	Woodland group
			Symbol	Symbol
Ab	Albany sand	6	IIIe-4	3w2
An	Angie fine sandy loam	6	IIIe-3	2w8
Ar	Ardilla loamy sand	7	IIw-3	2w2
Bb	Bibb association	8	Vw-1	2w9
BoC	Bonifay sand, 1 to 8 percent slopes	9	IIIs-1	3s2
Ch	Chipley sand	9	IIIs-2	2w2
DoA	Dothan loamy sand, 0 to 2 percent slopes	10	IIs-1	2o1
DoB	Dothan loamy sand, 2 to 5 percent slopes	11	IIe-1	2o1
DoC	Dothan loamy sand, 5 to 8 percent slopes	11	IIIe-1	2o1
Dt	Dothan complex	11	VIe-1	3s2
FcB	Faceville sandy loam, 2 to 5 percent slopes	13	IIe-2	3o1
FcC	Faceville sandy loam, 5 to 8 percent slopes	13	IIIe-2	3o1
FuC	Fuquay loamy sand, 1 to 8 percent slopes	14	IIs-2	3s2
GrB	Gritney loamy sand, 2 to 5 percent slopes	15	IIIe-3	3o1
GrC	Gritney loamy sand, 5 to 8 percent slopes	15	IVe-1	3o1
Ke	Kenansville fine sand	16	IIs-2	3s2
Ld	Lakeland sand	17	IVs-1	3s2
Le	Leefield loamy sand	18	IIw-2	3w2
LuC	Lucy loamy sand, 1 to 8 percent slopes	18	IIs-2	3s2
Md	Maxton loamy fine sand	19	IIe-1	2o7
OrB	Orangeburg loamy sand, 2 to 5 percent slopes	20	IIe-1	2o1
OrC	Orangeburg loamy sand, 5 to 8 percent slopes	20	IIIe-1	2o1
Pa	Pansey loamy sand	21	IVw-2	3w9
Pg	Pantego complex	21	Vw-2	2w9
Pm	Plummer fine sand	22	IVw-1	2w3
StA	Stilson loamy sand, 1 to 3 percent slopes	23	IIw-1	3s2
TfB	Tifton loamy sand, 2 to 5 percent slopes	24	IIe-1	3o1
TfC	Tifton loamy sand, 5 to 8 percent slopes	24	IIIe-1	3o1
TrC	Troup sand, 1 to 8 percent slopes	25	IIIs-1	3s2

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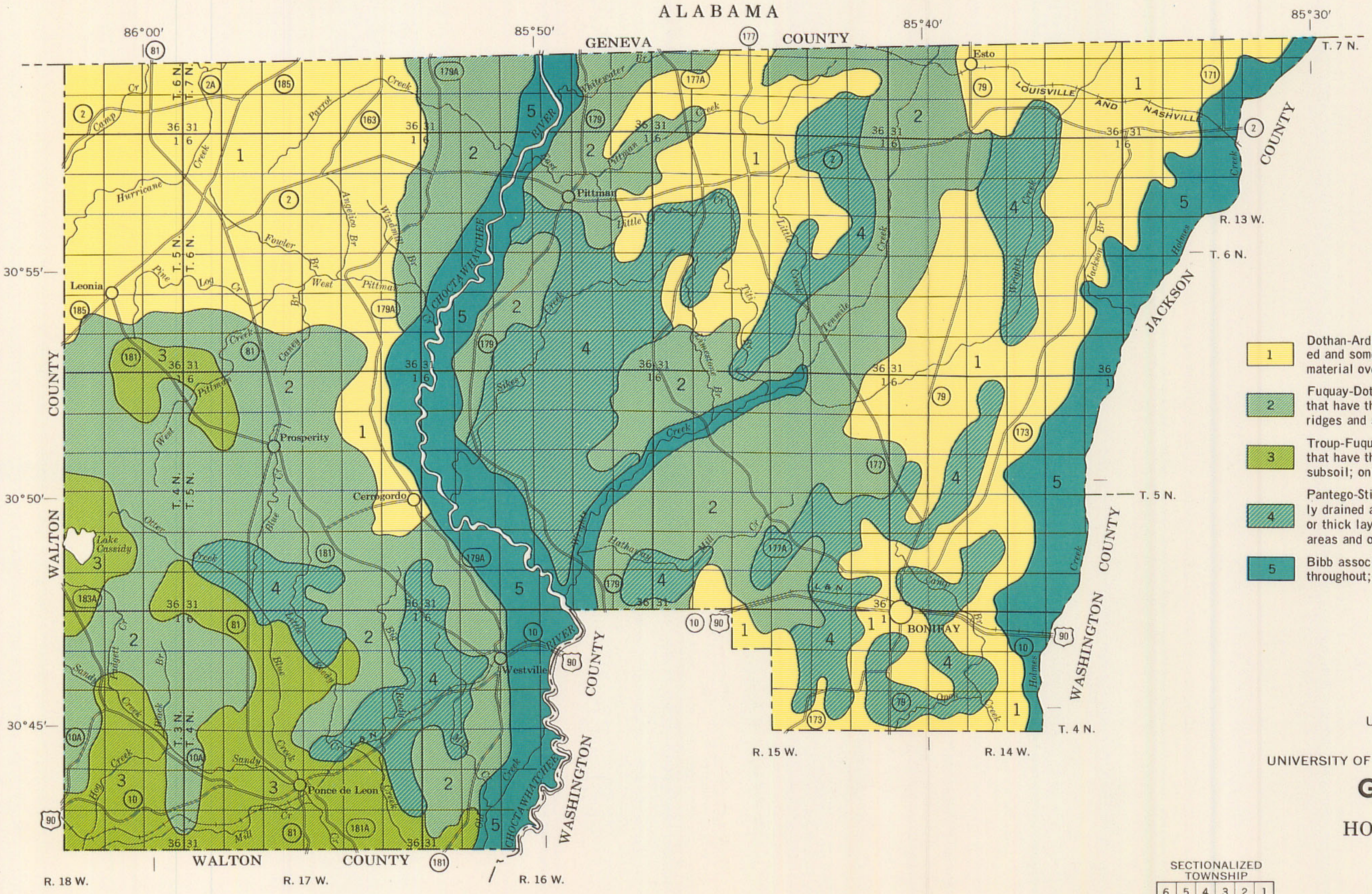


SOIL ASSOCIATIONS

1	Dothan-Ardilla association: Nearly level to strongly sloping, well-drained and somewhat poorly drained soils that have thin layers of sandy material over a loamy subsoil; on ridges and side slopes
2	Fuquay-Dothan association: Nearly level to sloping, well-drained soils that have thick or thin layers of sandy material over a loamy subsoil; on ridges and side slopes
3	Troup-Fuquay association: Nearly level to sloping, well-drained soils that have thick to extremely thick layers of sandy material over a loamy subsoil; on ridges and side slopes
4	Pantego-Stilson association: Nearly level and gently sloping, very poorly drained and moderately well drained soils that have moderately thick or thick layers of sandy material over a loamy subsoil; in depressed areas and on ridges
5	Bibb association: Nearly level, poorly drained soils that are loamy throughout; on flood plains

Compiled 1973

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
UNIVERSITY OF FLORIDA AGRICULTURAL EXPERIMENT STATIONS

GENERAL SOIL MAP

HOLMES COUNTY, FLORIDA

Scale 1:190,080

1 0 1 2 3 4 Miles

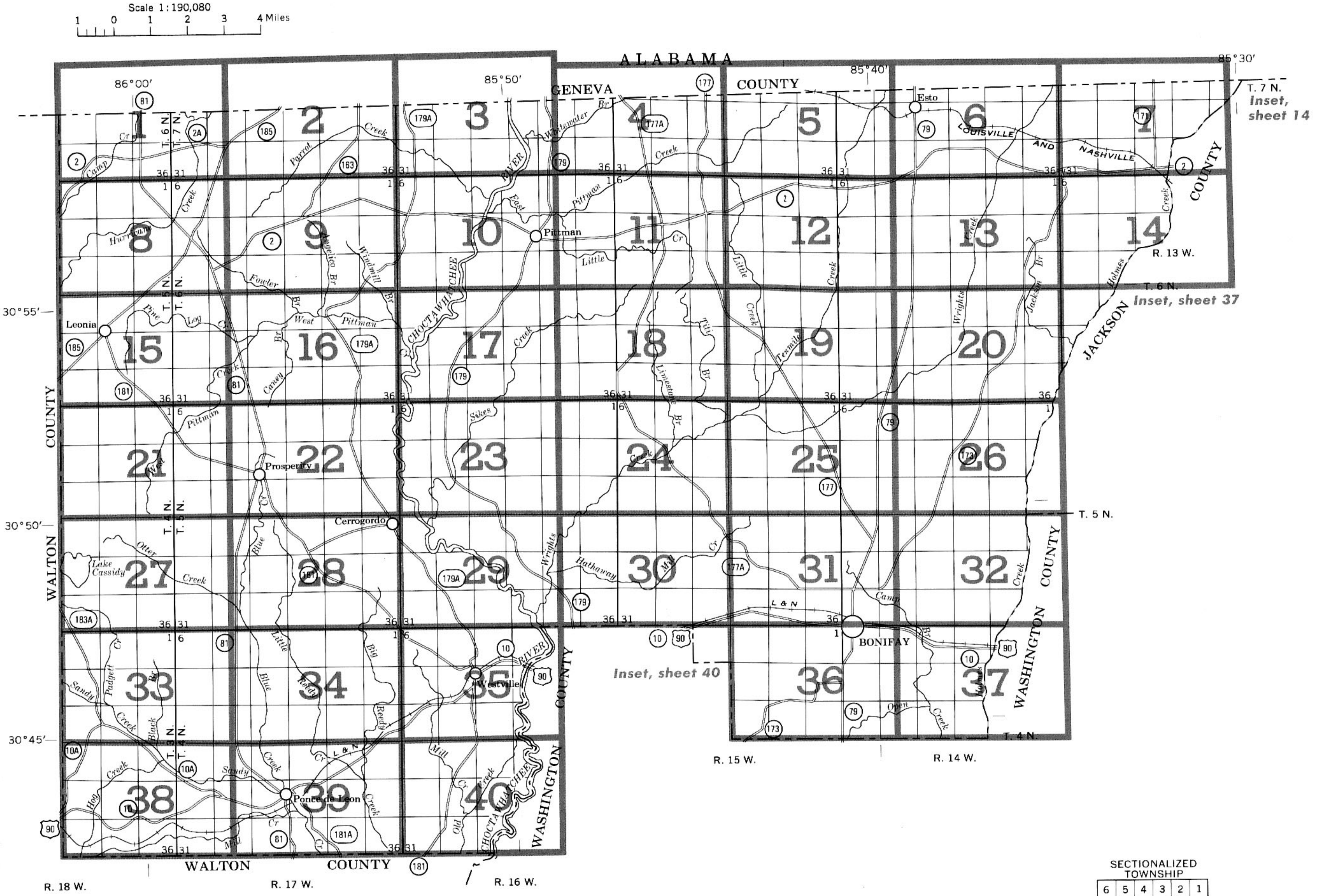
SECTIONALIZED TOWNSHIP

6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

Each area outlined on this map consists of more than one kind of soil. The map is thus meant for general planning rather than a basis for decisions on the use of specific tracts.

INDEX TO MAP SHEETS

HOLMES COUNTY, FLORIDA



6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

CONVENTIONAL SIGNS

WORKS AND STRUCTURES

Highways and roads
- Divided
- Good motor
- Poor motor
- Trail

Highway markers
- National Interstate
- U. S.
- State or county

Railroads
- Single track
- Multiple track
- Abandoned

Bridges and crossings
- Road
- Trail
- Railroad
- Ferry (FY)
- Ford (FORD)
- Grade
- R. R. over
- R. R. under

Buildings
- School
- Church

Borrow pit (B.P.)

Gravel pit

Power line

Pipeline

Cemetery

Dams

Levee

Tanks

Well, oil or gas

Forest fire or lookout station

Windmill

Located object

BOUNDARIES

- National or state
- County
- Minor civil division
- Reservation
- Land grant
- Small park, cemetery, airport
- Land survey division corners

DRAINAGE

Streams, double-line
- Perennial
- Intermittent

Streams, single-line
- Perennial
- Intermittent
  - Crossable with tillage implements
  - Not crossable with tillage implements
  - Unclassified

Canals and ditches

Lakes and ponds
- Perennial (water, w)
- Intermittent (int)

Spring

Marsh or swamp

Wet spot

Drainage end or alluvial fan

RELIEF

Escarpments
- Bedrock
- Other

Short steep slope

Prominent peak

Depressions (Large, Small)
- Crossable with tillage implements
- Not crossable with tillage implements
- Contains water most of the time

SOIL SURVEY DATA

- Soil boundary and symbol (Dx)
- Gravel
- Stoniness: Stony; Very stony
- Rock outcrops
- Chert fragments
- Clay spot
- Sand spot
- Gumbo or scabby spot
- Made land
- Severely eroded spot
- Blowout, wind erosion
- Gully

SOIL LEGEND

The first capital letter is the initial one of the soil name. A second capital letter, A, B, or C, indicates the class of slope. Most symbols without a slope letter are for nearly level or gently sloping soils, but some are for soils that have stronger slopes.

SYMBOL	NAME
Ab	Albany sand
An	Angie fine sandy loam
Ar	Ardilla loamy sand
Bb	Bibb association *
BoC	Bonifay sand, 1 to 8 percent slopes
Ch	Chipley sand
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DoB	Dothan loamy sand, 2 to 5 percent slopes
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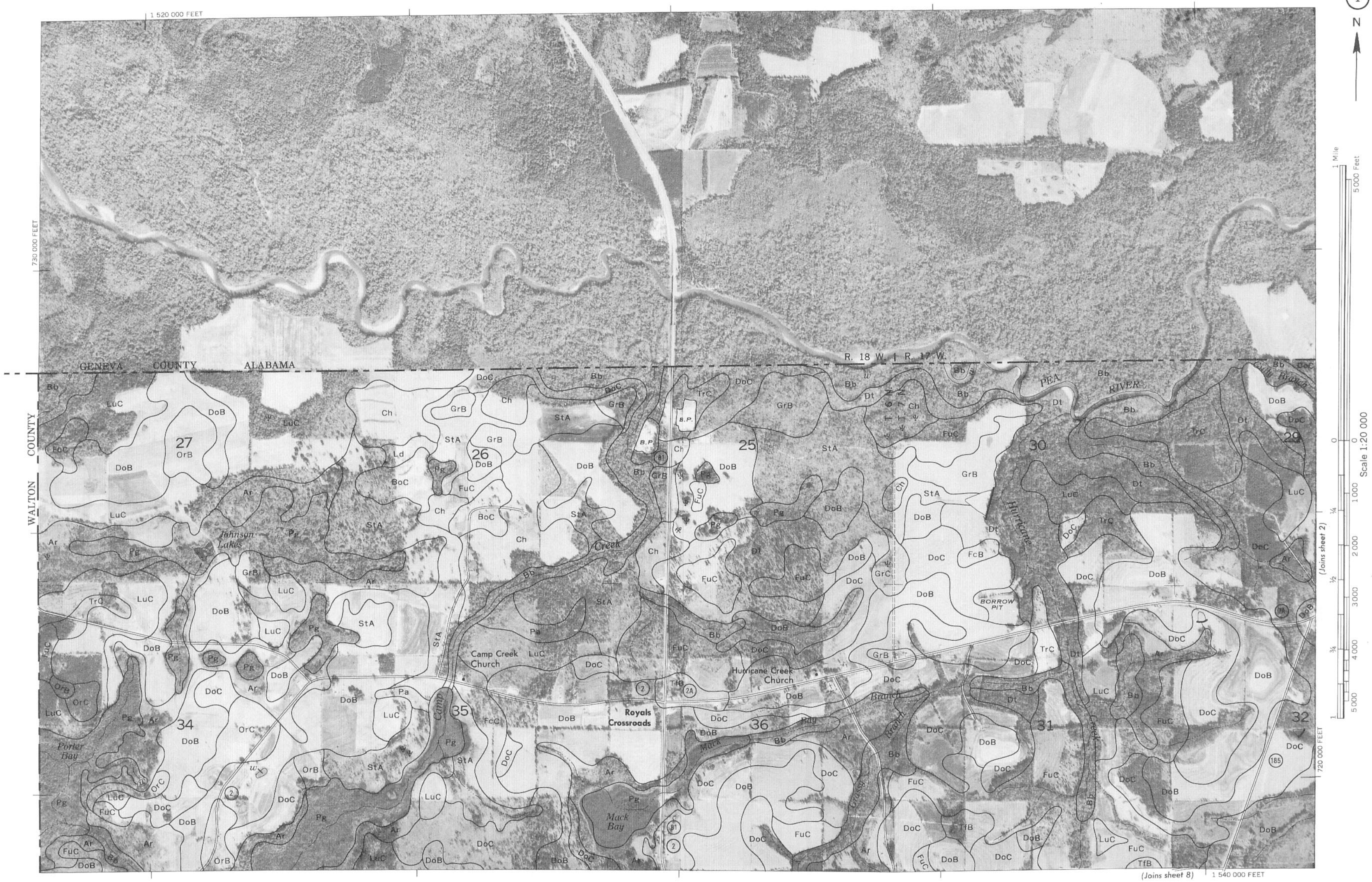
Pa	Pansey loamy sand
Pg	Pantego complex *
Pm	Plummer fine sand
StA	Stilson loamy sand, 1 to 3 percent slopes
TfB	Tifton loamy sand, 2 to 5 percent slopes
TfC	Tifton loamy sand, 5 to 8 percent slopes
TrC	Troup sand, 1 to 8 percent slopes

* The delineations generally are larger and the composition of the mapping unit is more variable than that of other mapping units in this county. Mapping has been controlled well enough, however, for the anticipated use of the soils.

HOLMES COUNTY, FLORIDA — SHEET NUMBER 1



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Photobase from 1969 aerial photography. Positions of 5,000-foot grid ticks are approximate and based on the Florida Coordinate system, north zone.

Land division corners are approximately positioned on this map.

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N

Scale 1:20 000

1 Mile

5000 Feet

0 ¼ ½ ¾ 1

0 1000 2000 3000 4000 5000

4

N

Scale 1:20 000

1 Mile

5 000 Feet

0 ¼ ½ ¾ 1

0 1 000 2 000 3 000 4 000 5 000

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6

N

1 Mile
5 000 Feet

Scale 1:20 000

0 ¼ ½ ¾ 1

0 1000 2000 3000 4000 5000

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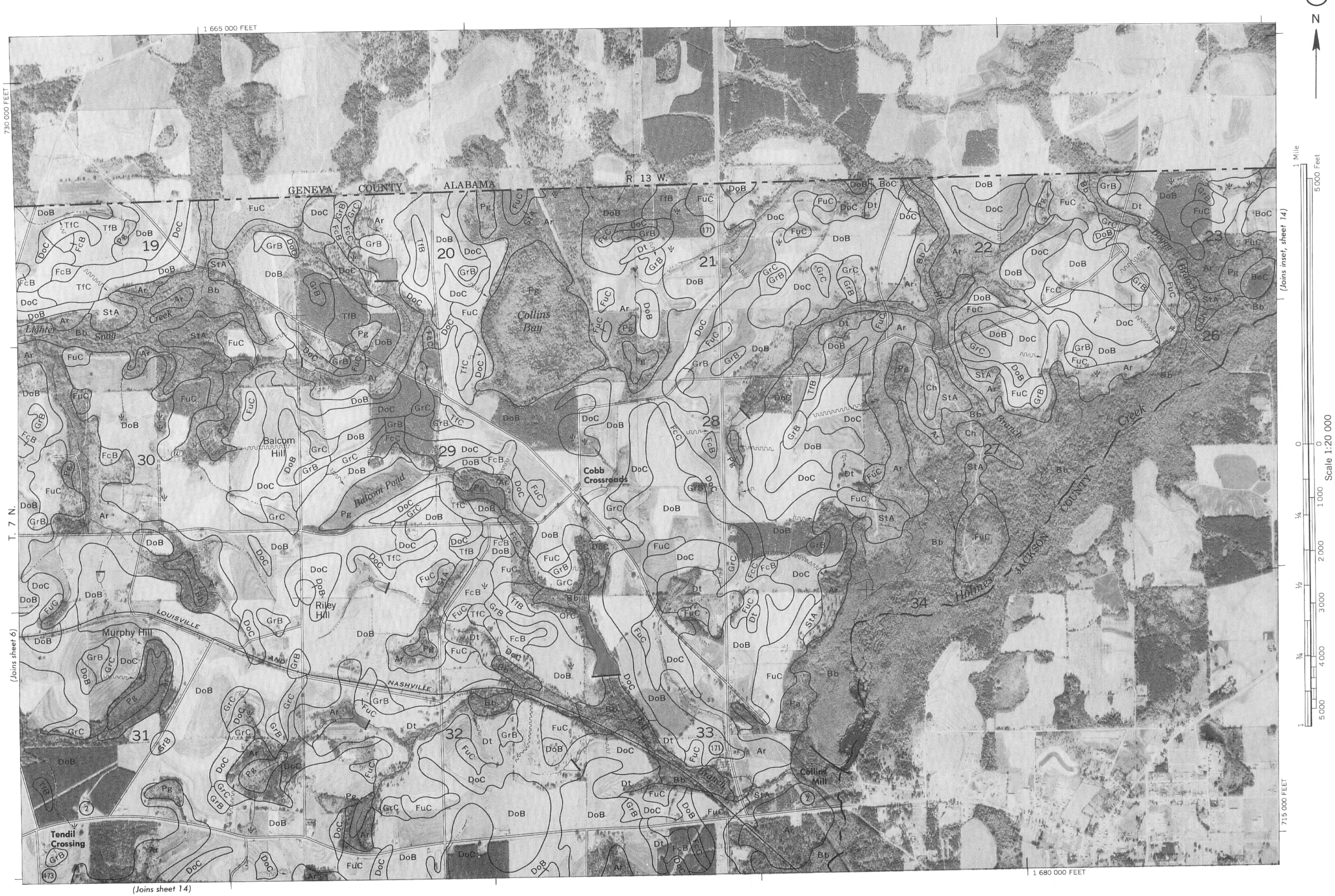

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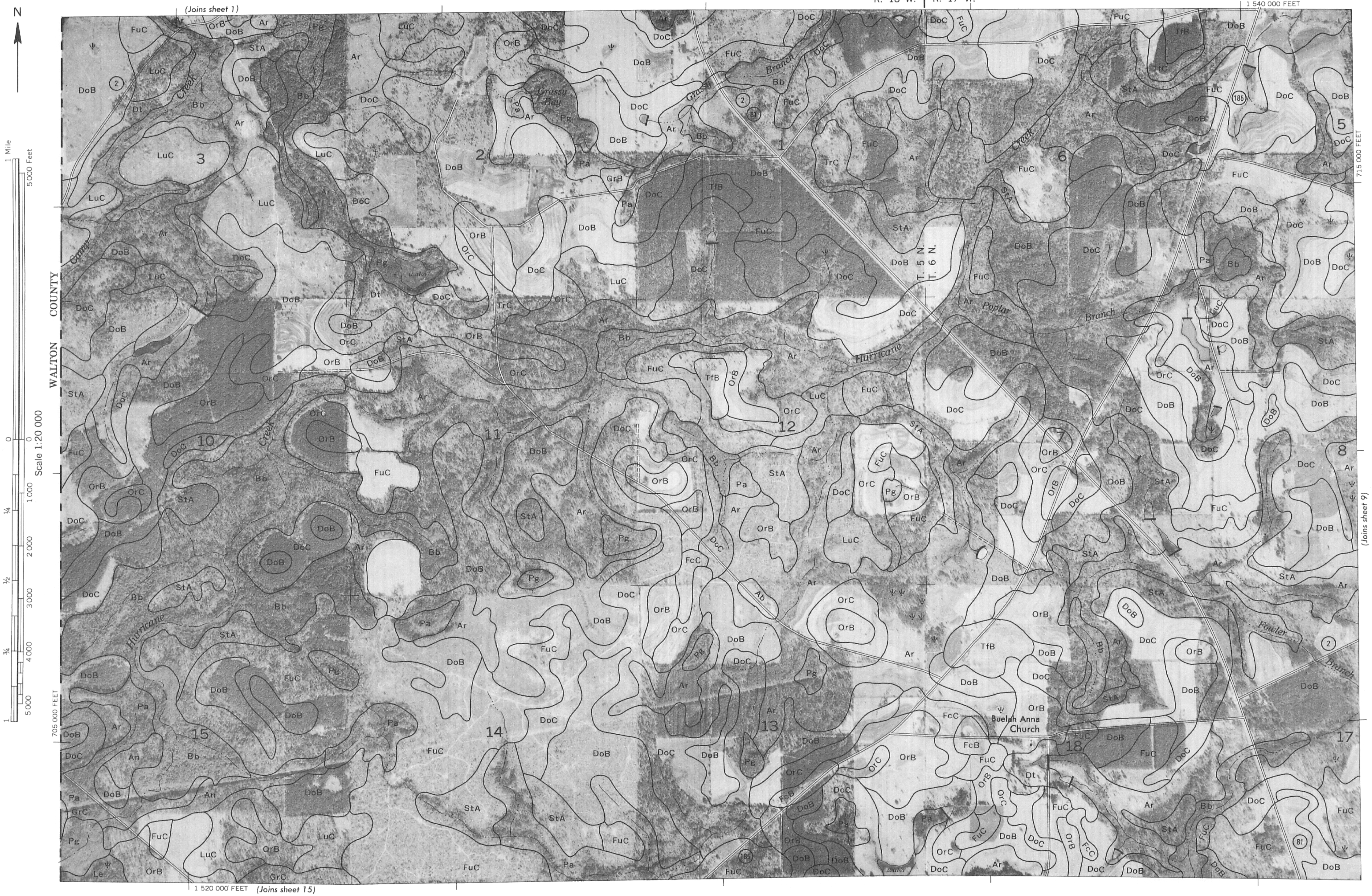

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HOLMES COUNTY, FLORIDA — SHEET NUMBER 10

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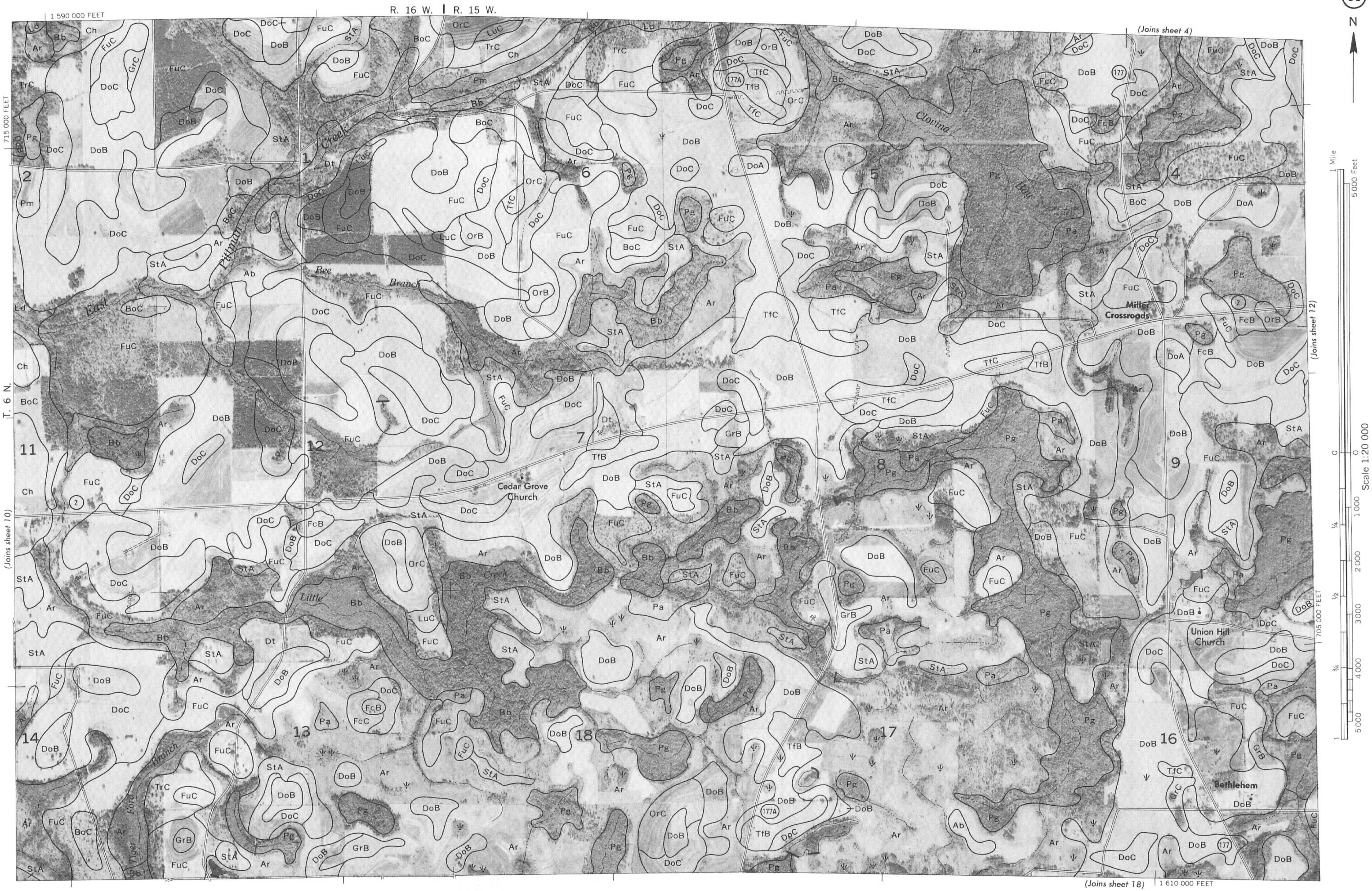
HOLMES COUNTY, FLORIDA — SHEET NUMBER 11



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HOLMES COUNTY, FLORIDA — SHEET NUMBER 12

N

1 Mile
5 000 Feet
Scale 1:20 000
0 1 000 2 000 3 000 4 000 5 000
0 ¼ ½ ¾ 1

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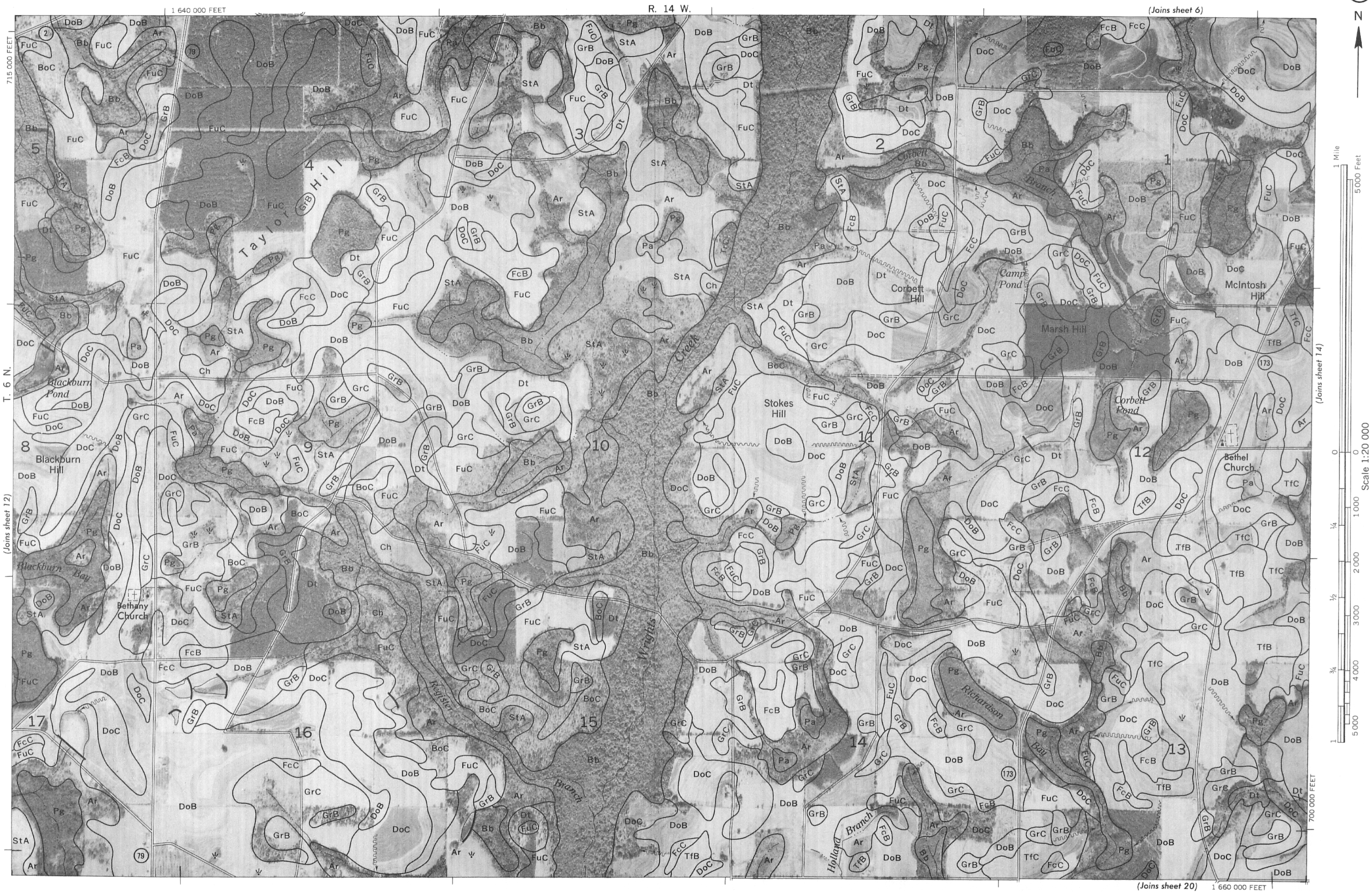

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HOLMES COUNTY, FLORIDA — SHEET NUMBER 14

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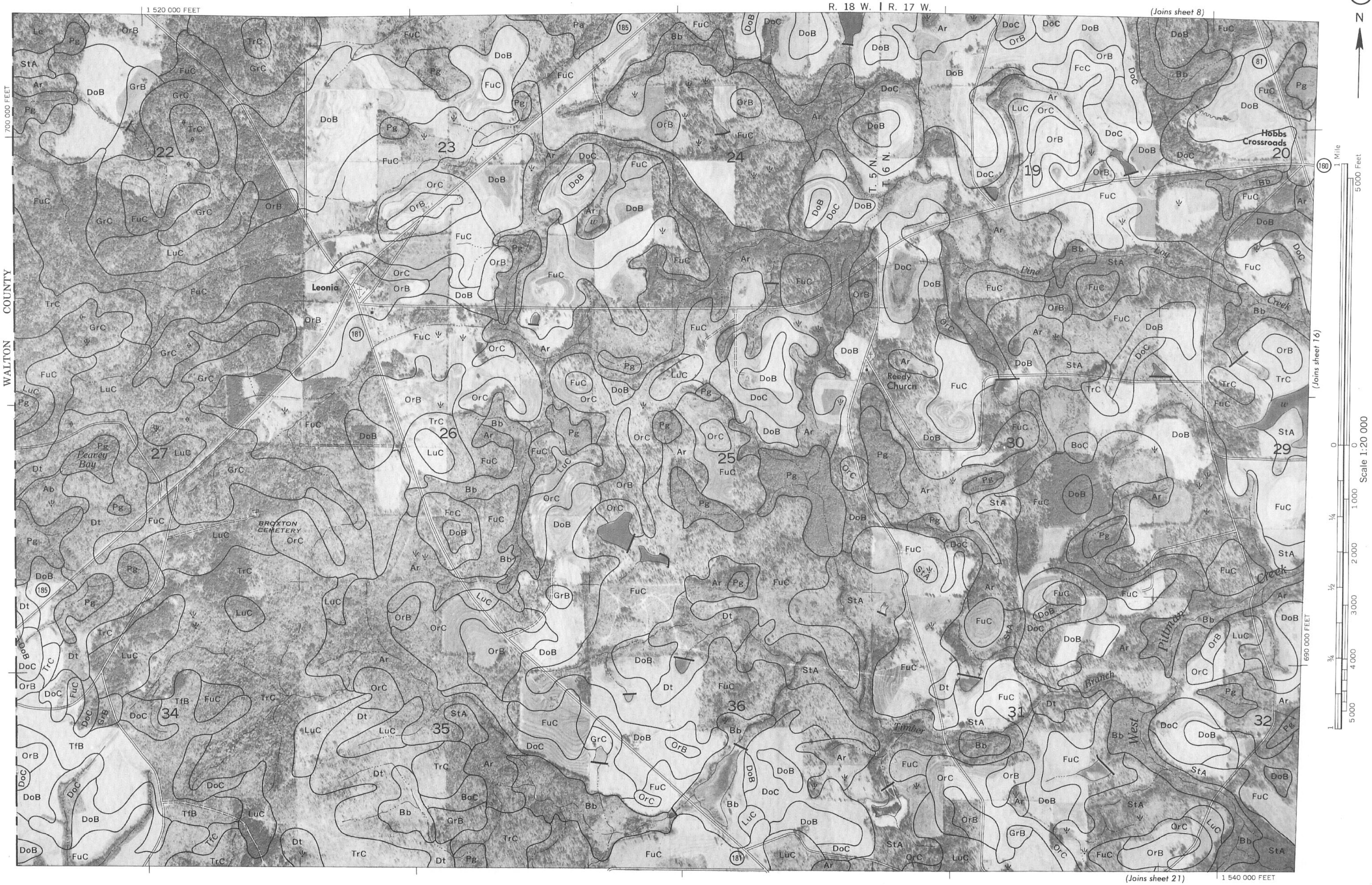

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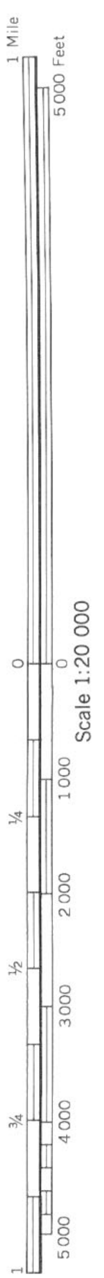
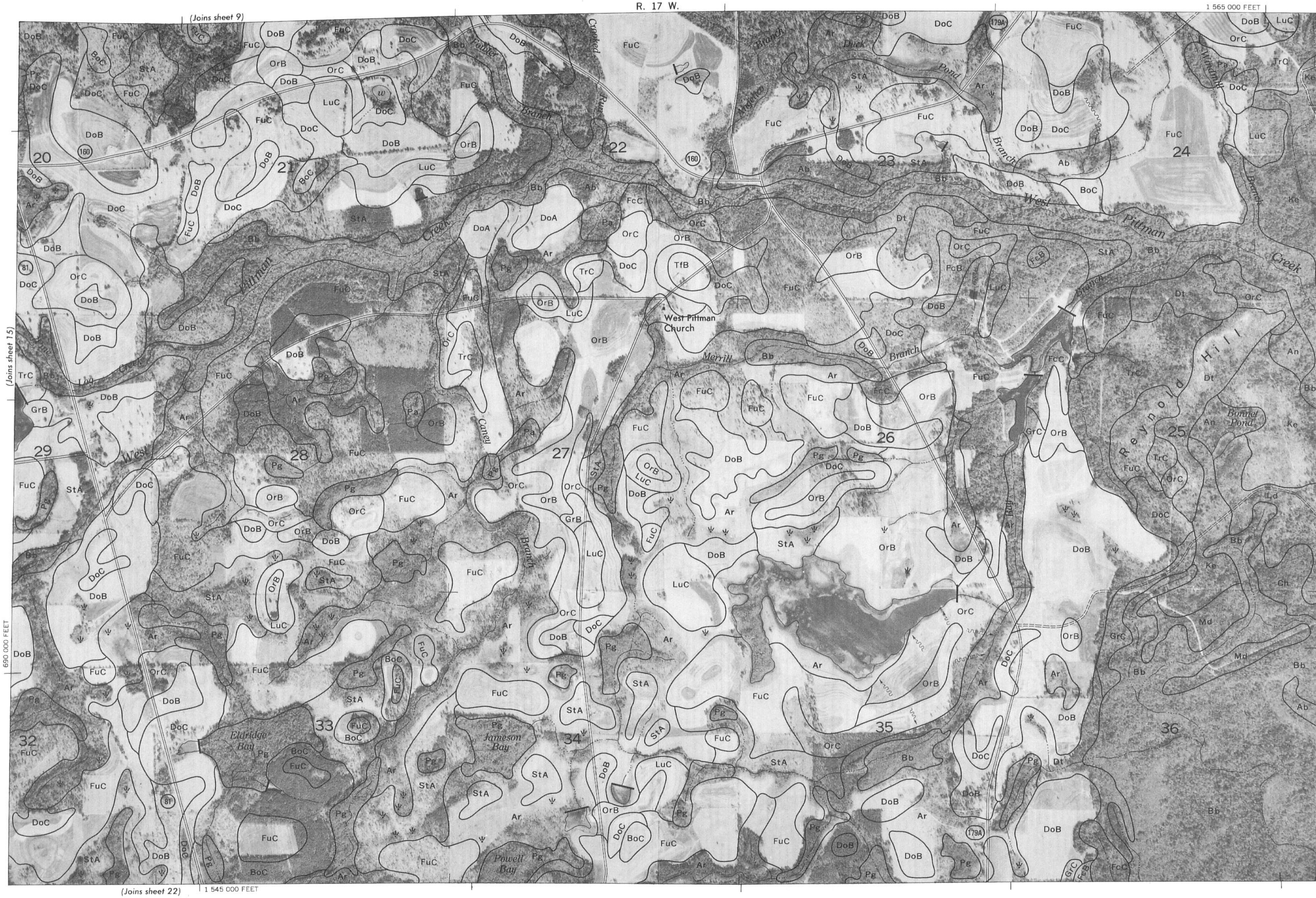
16

N





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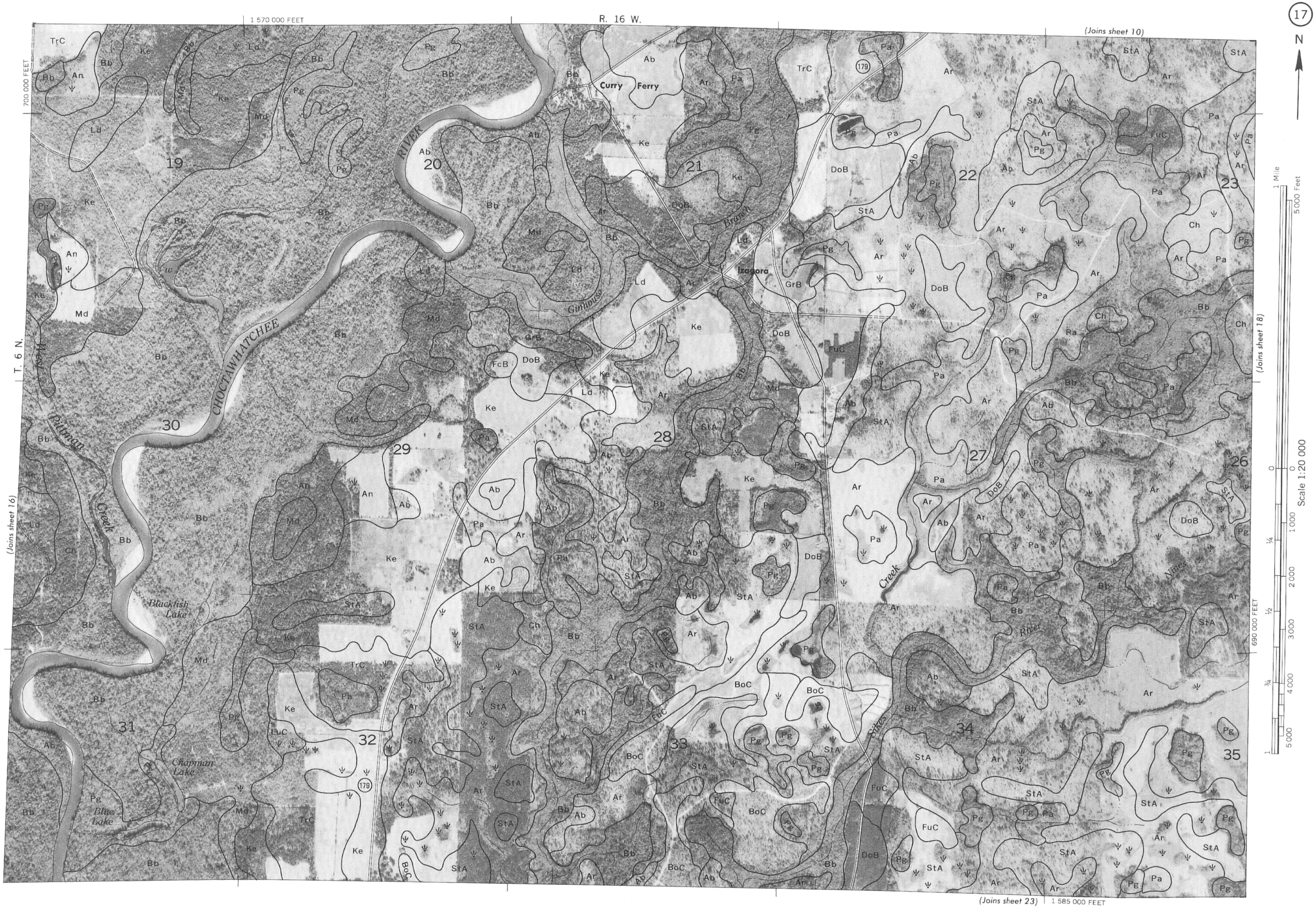

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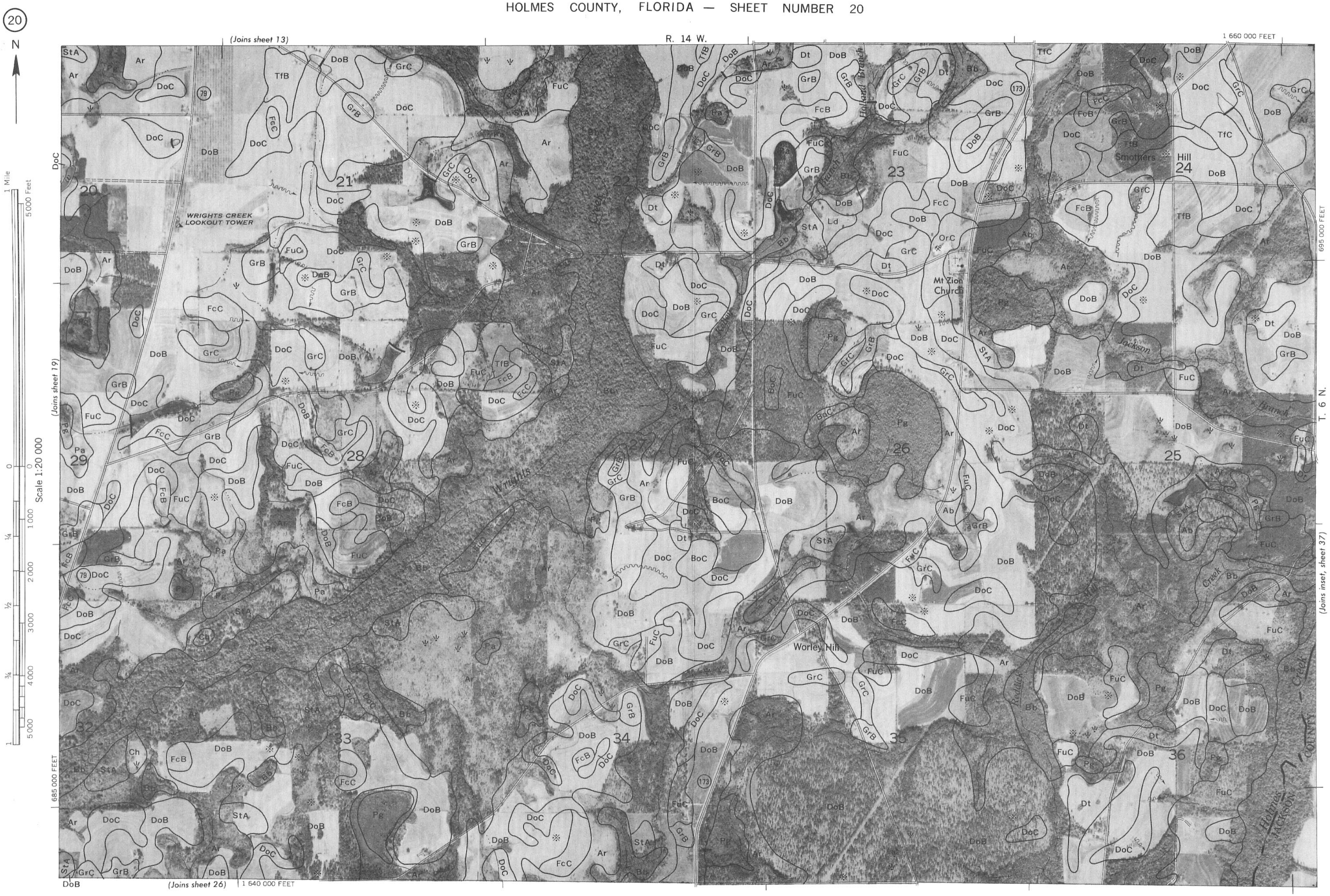

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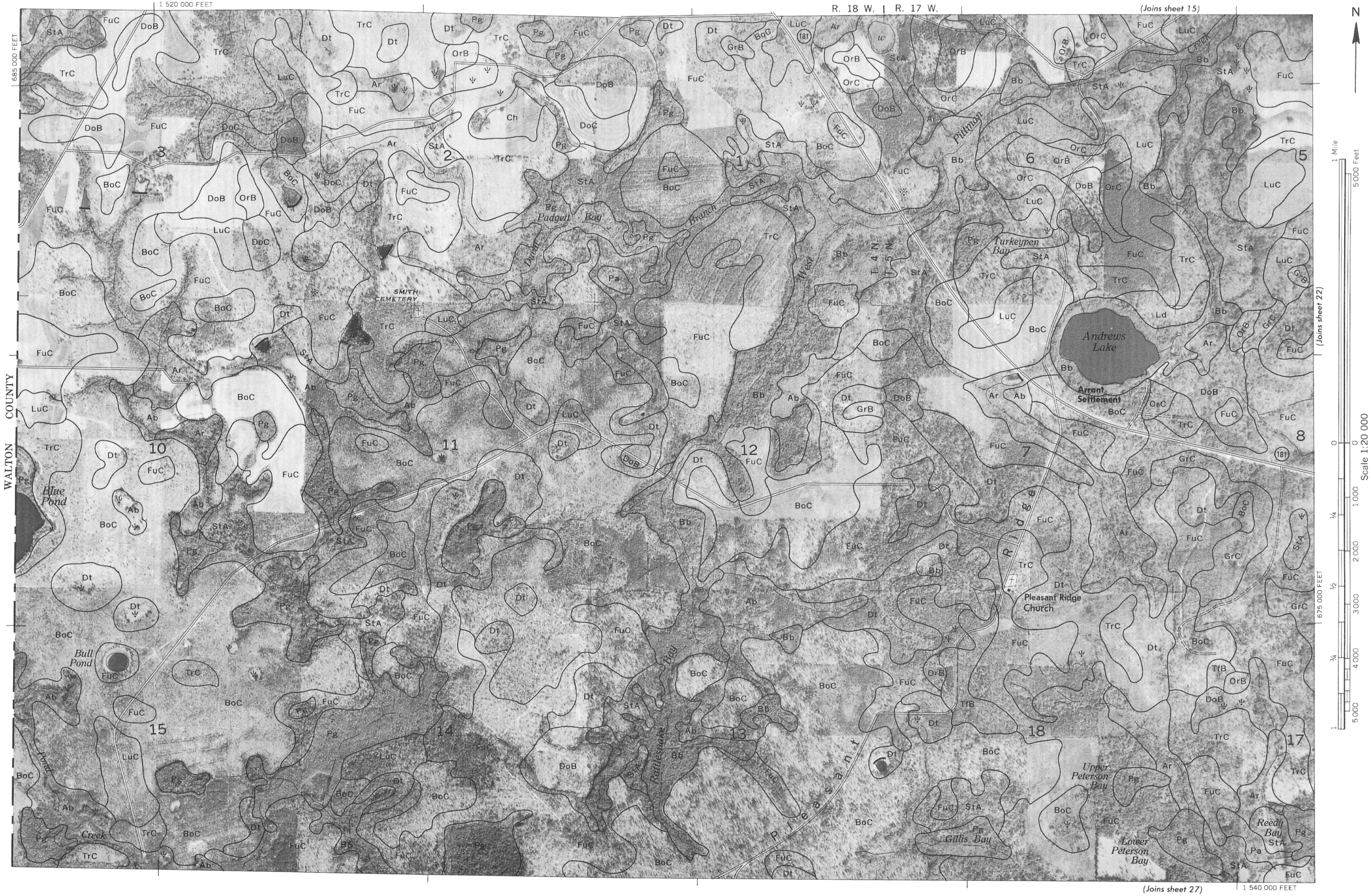

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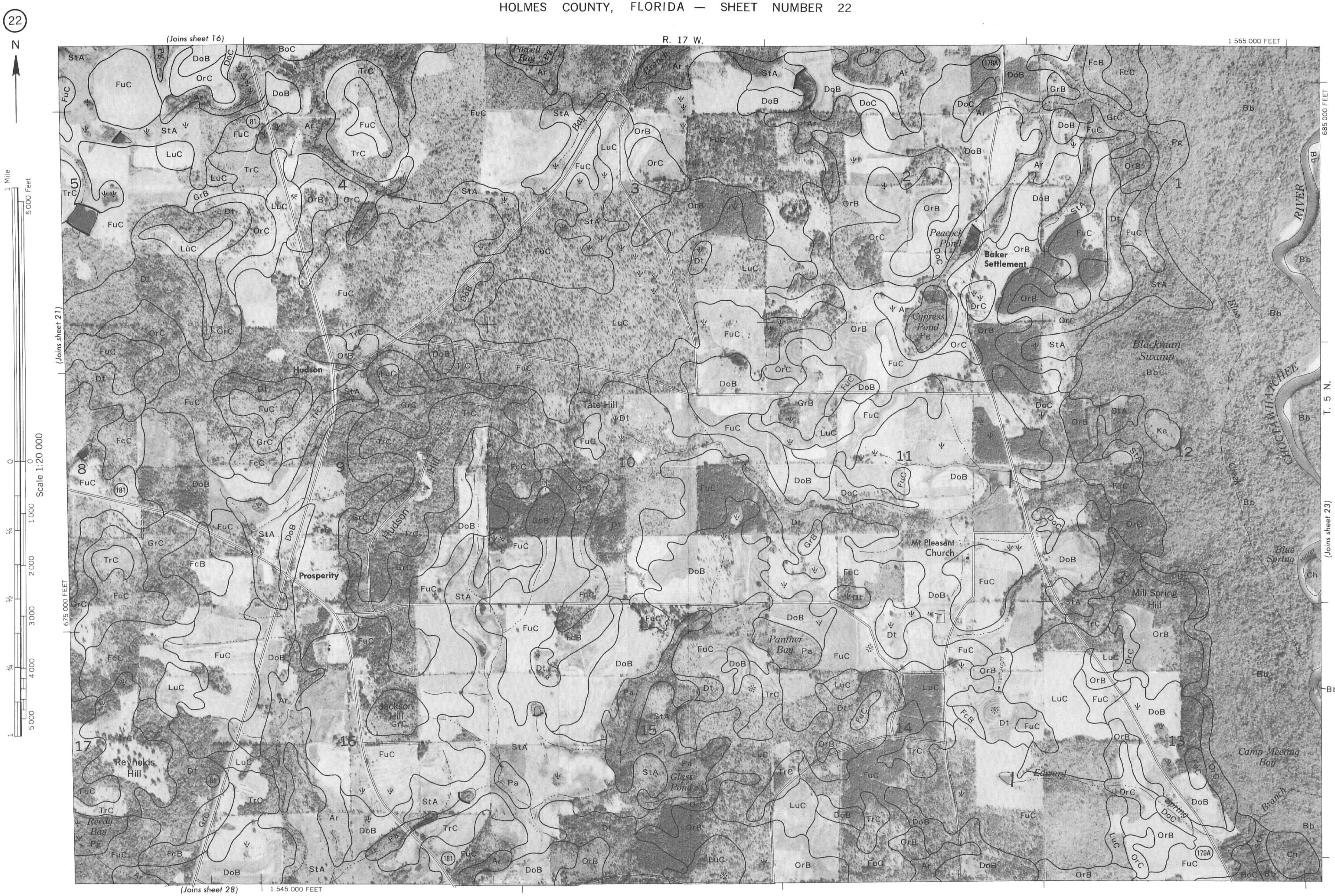

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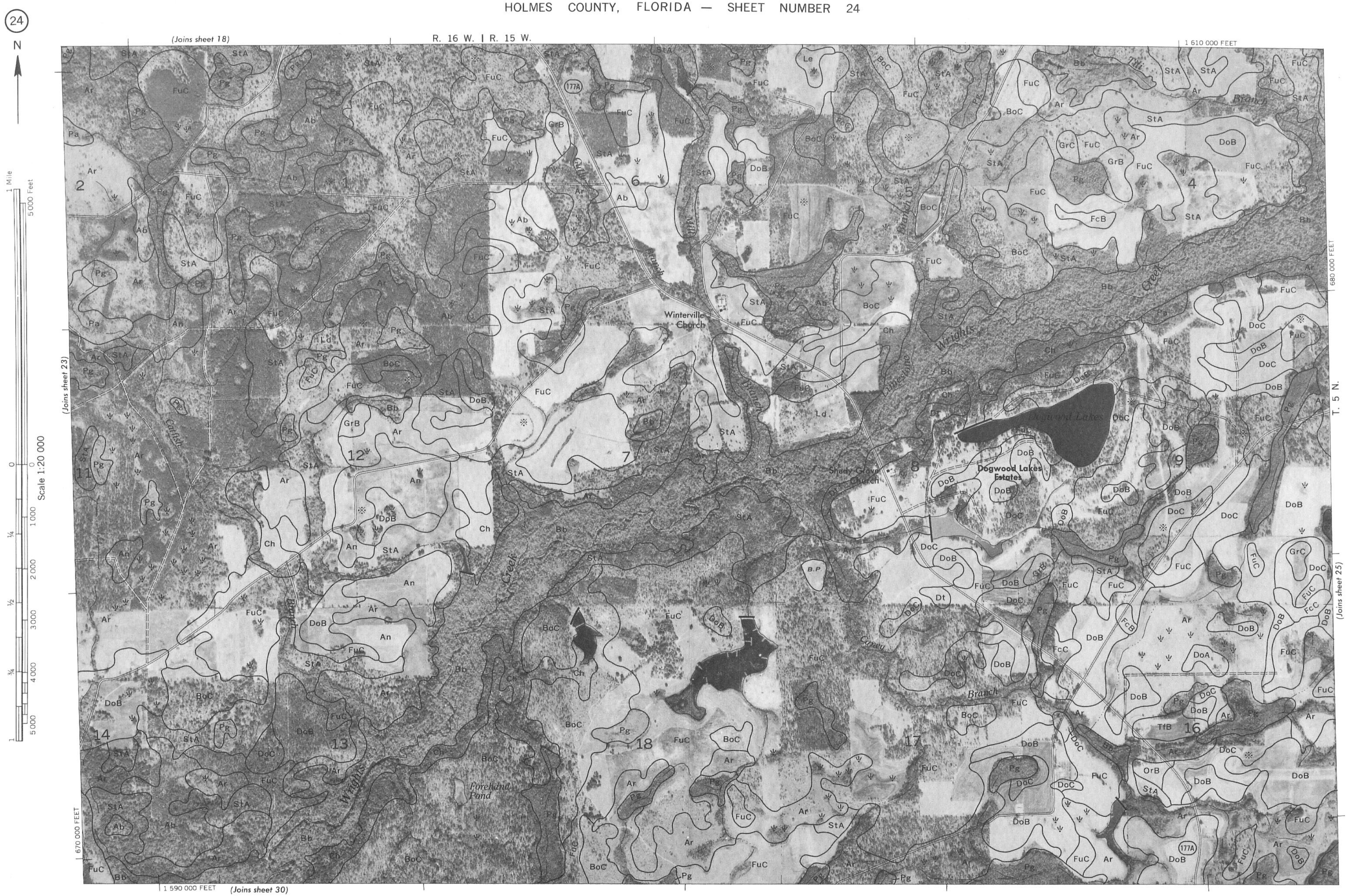

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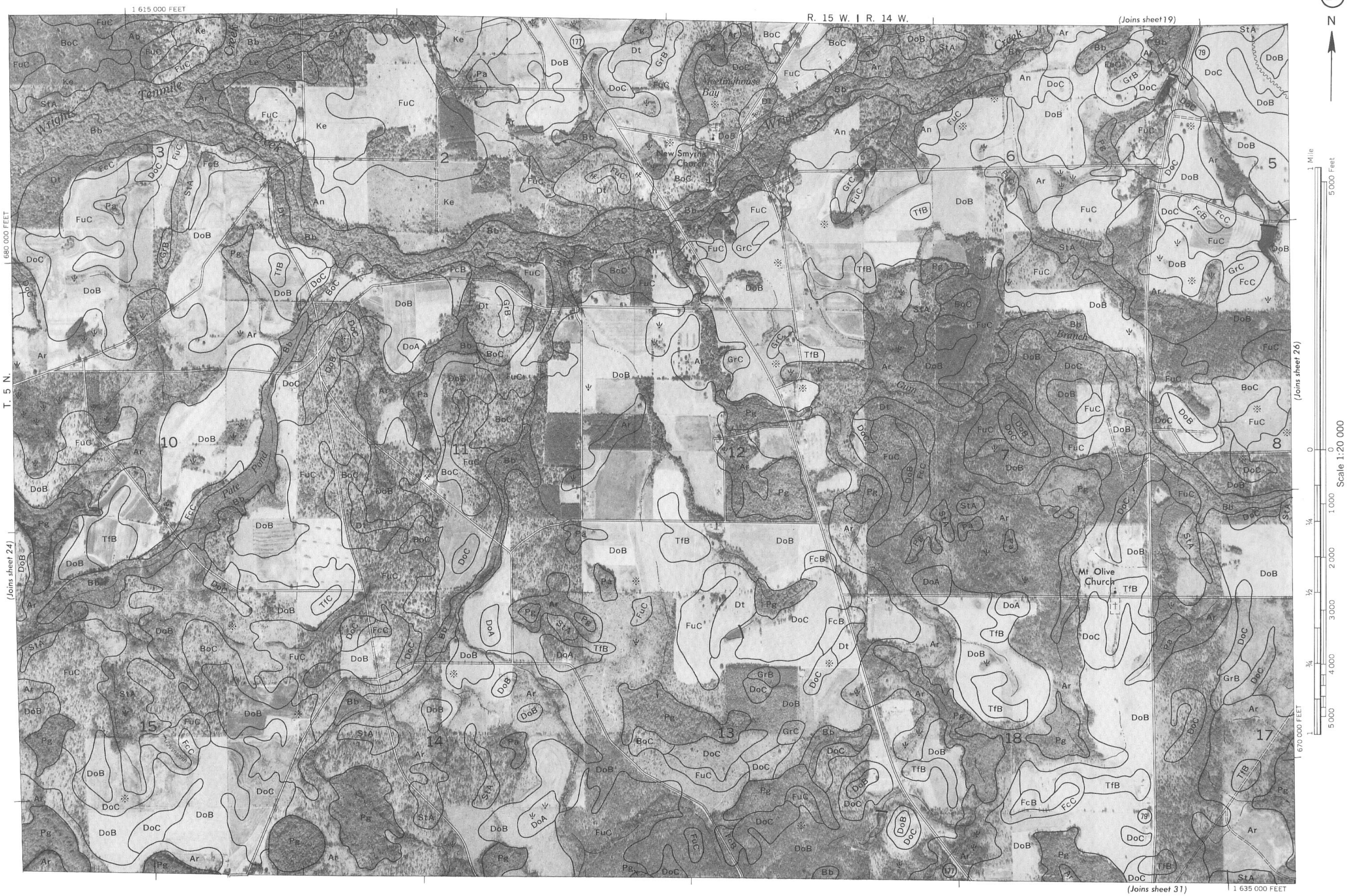

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HOLMES COUNTY, FLORIDA — SHEET NUMBER 26

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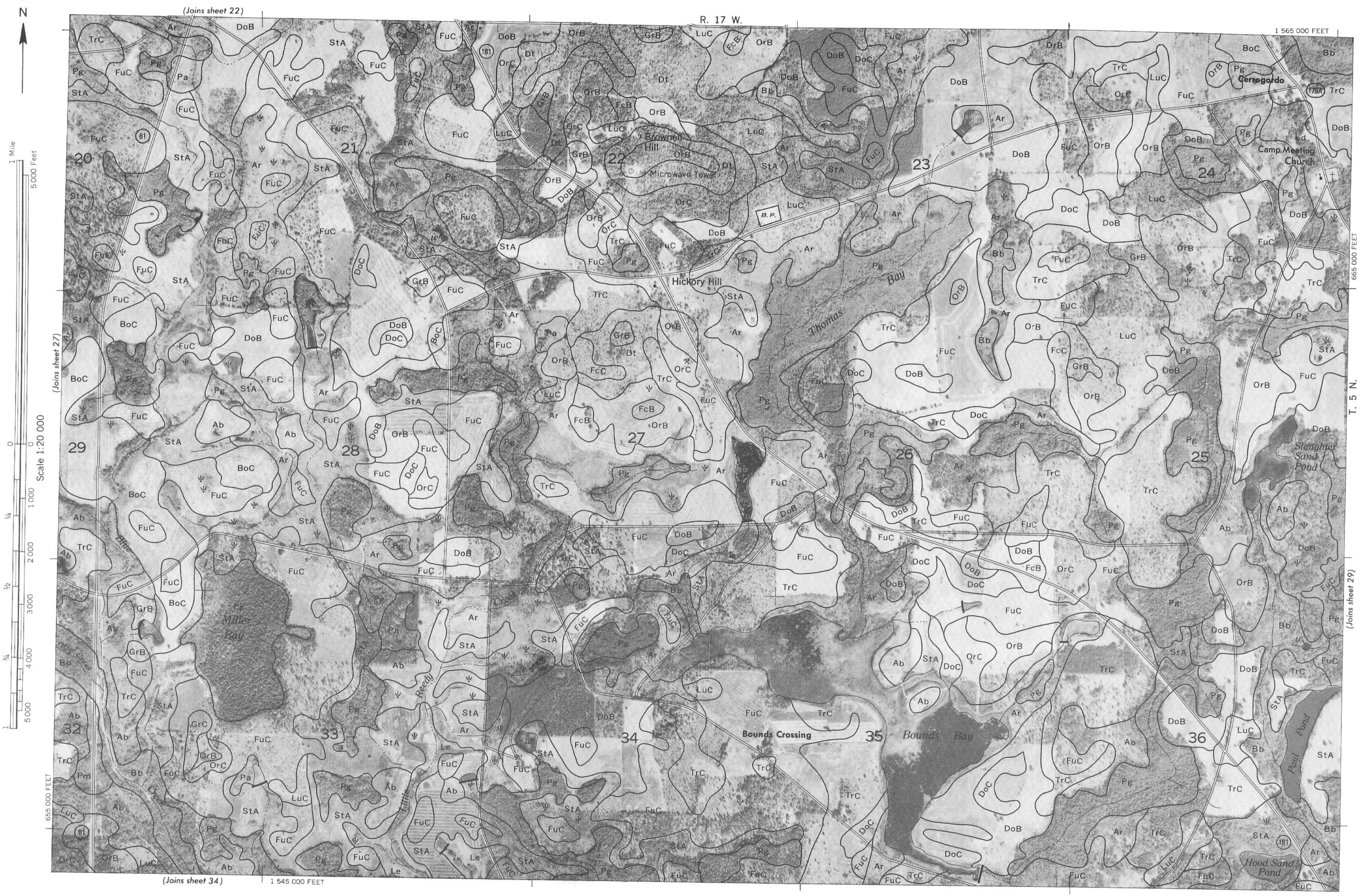
Land division corners are approximately positioned on this map.

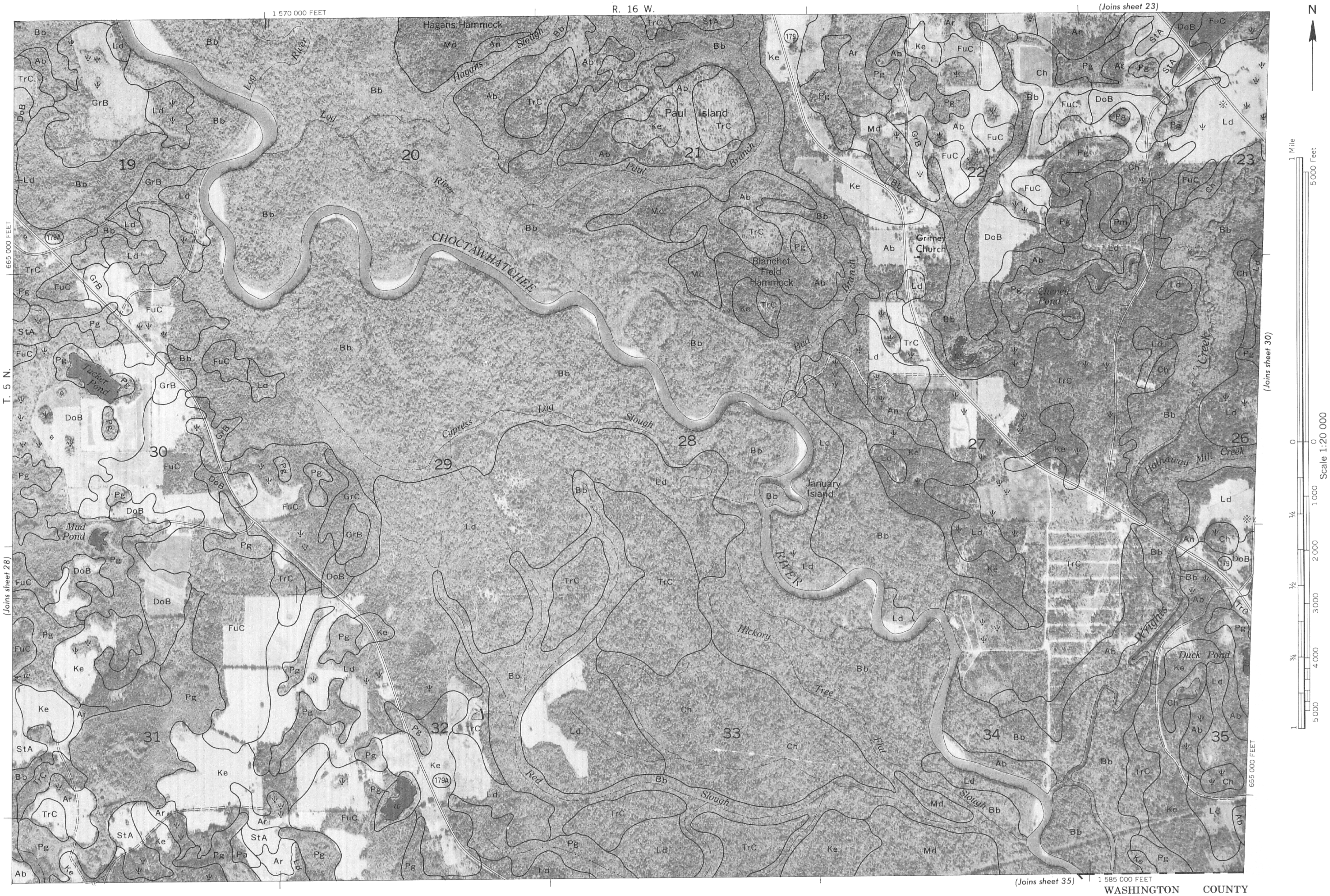
HOLMES COUNTY, FLORIDA — SHEET NUMBER 28



Land division corners are approximately positioned on this map.

Photobase from 1969 aerial photography. Positions of 5,000-foot grid ticks are approximate and based on the Florida Coordinate system, north zone.

This map is one of a set compiled in 1972 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, and the University of Florida, Agricultural Experiment Stations.



This map is one of a set compiled in 1972 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, and the University of Florida, Agricultural Experiment Stations.
Photobase from 1969 aerial photography. Positions of 5,000-foot grid ticks are approximate and based on the Florida Coordinate system, north zone.
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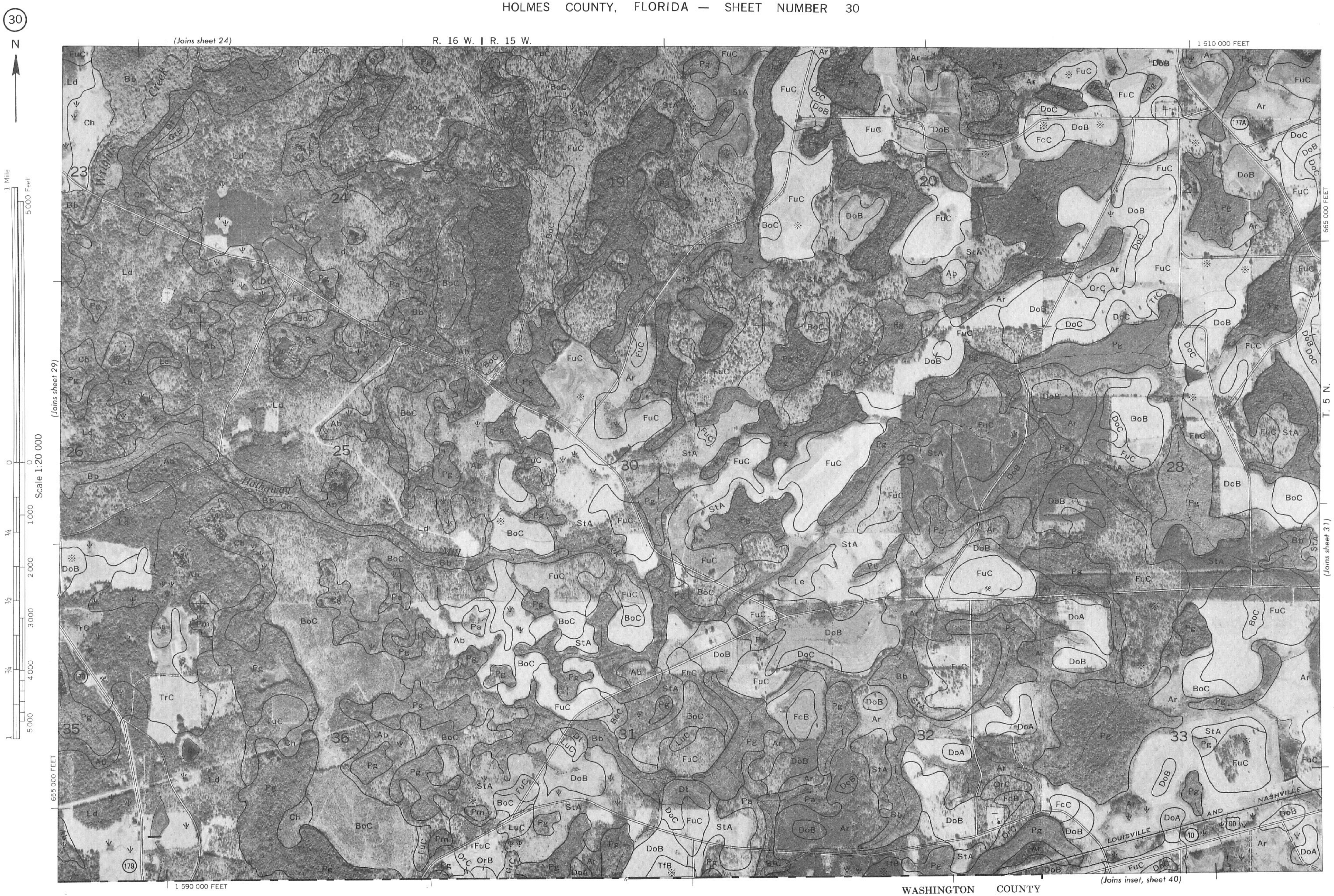

Land division corners are approximately positioned on this map.

Photobase from 1969 aerial photography. Positions of 5,000-foot grid ticks are approximate and based on the Florida Coordinate system, north zone.

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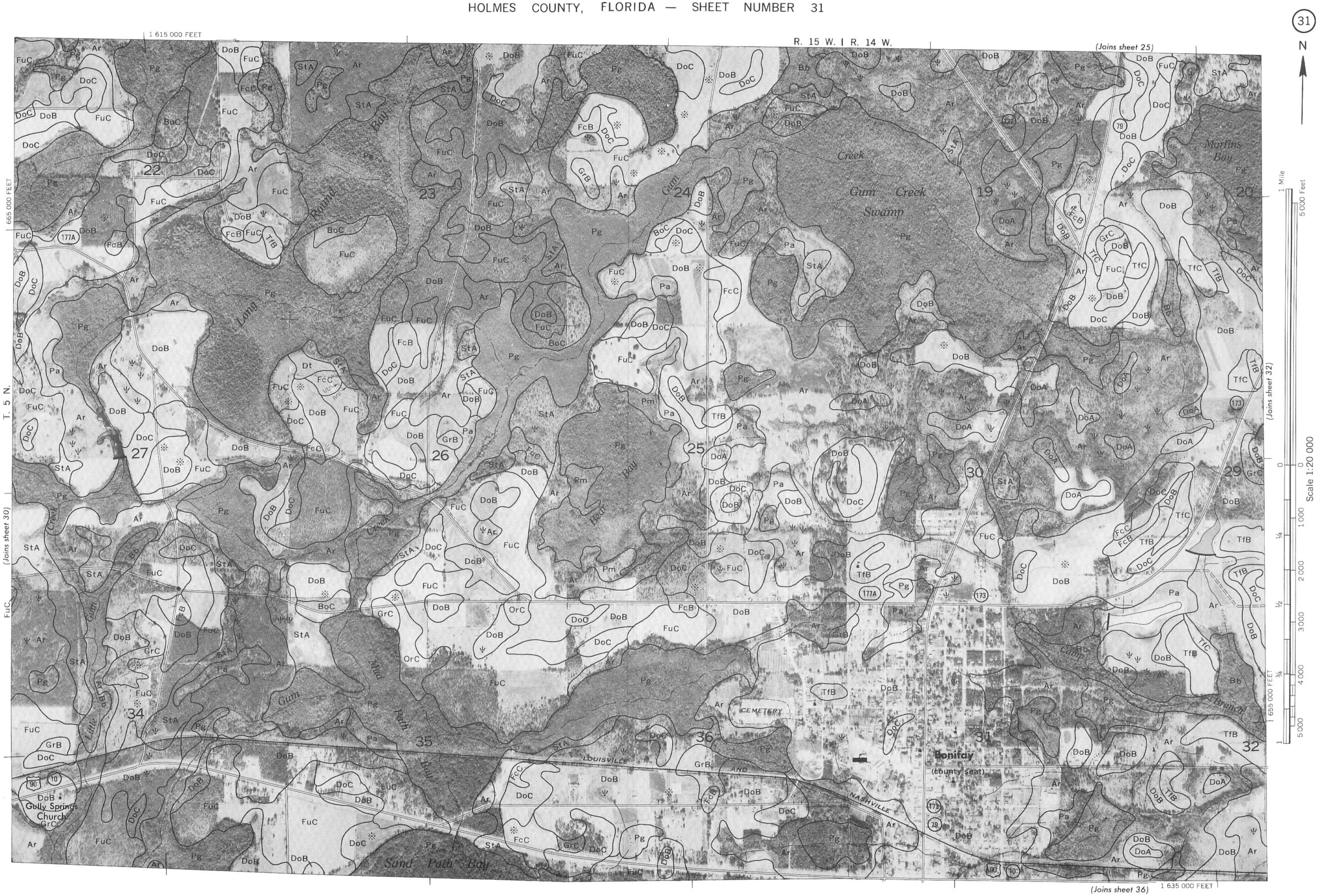

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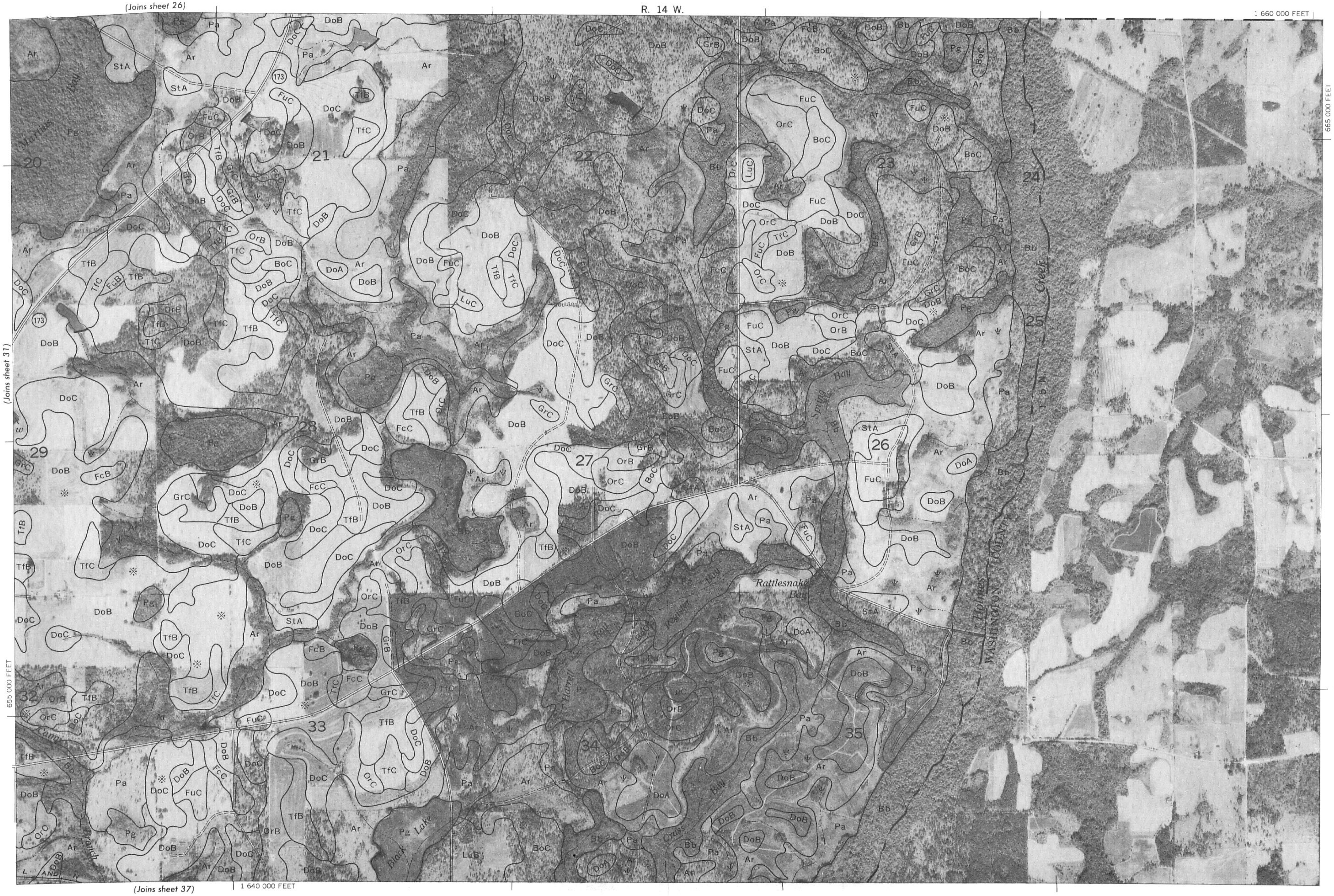
Land division corners are approximately positioned on this map.

(32)

N

1 Mile
5000 Feet
Scale 1:20 000
0 ¼ ½ ¾ 1
0 1000 2000 3000 4000 5000



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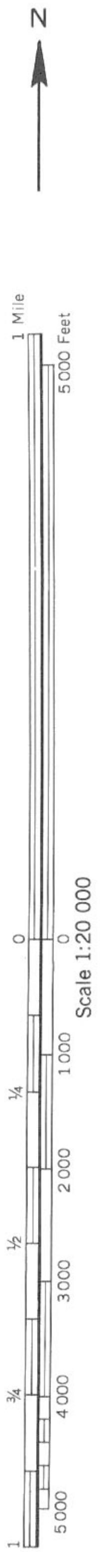
Photobase from 1969 aerial photography. Positions of 5,000-foot grid ticks are approximate and based on the Florida Coordinate system, north zone.
Land division corners are approximately positioned on this map.

HOLMES COUNTY, FLORIDA — SHEET NUMBER 34



Land division corners are approximately positioned on this map.

Photobase from 1969 aerial photography. Positions of 5,000-foot grid ticks are approximate and based on the Florida Coordinate system, north zone.

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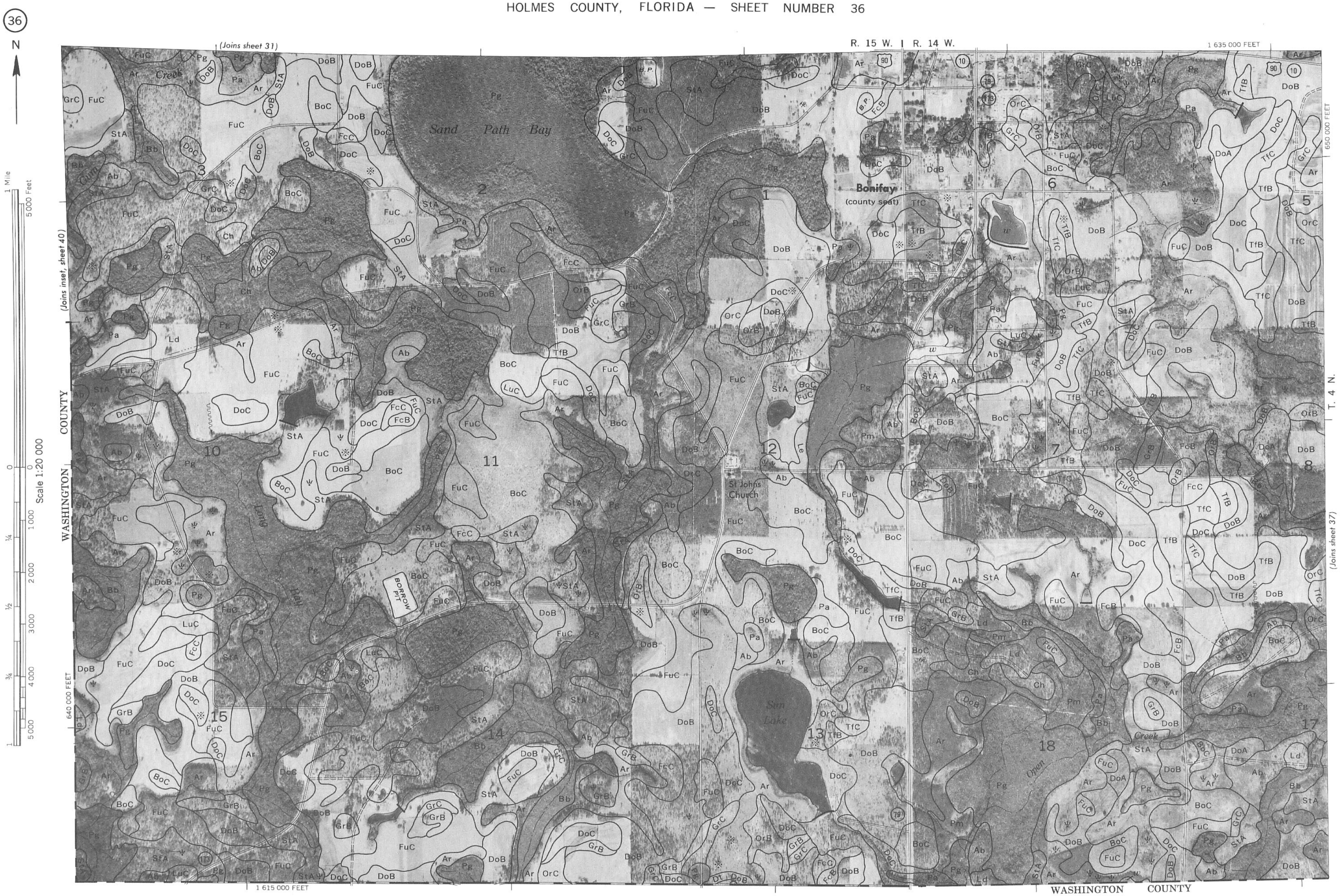
Photobase from 1969 aerial photography. Positions of 5,000-foot grid ticks are approximate and based on the Florida Coordinate system, north zone.
Land division corners are approximately positioned on this map.



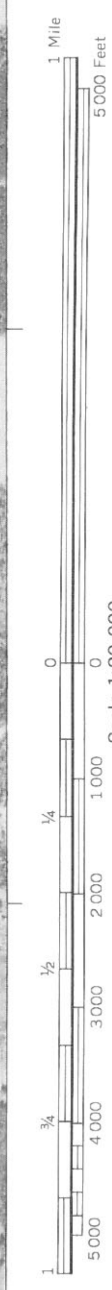
Land division corners are approximately positioned on this map.

Photobase from 1969 aerial photography. Positions of 5,000-foot grid ticks are approximate and based on the Florida Coordinate system, north zone.

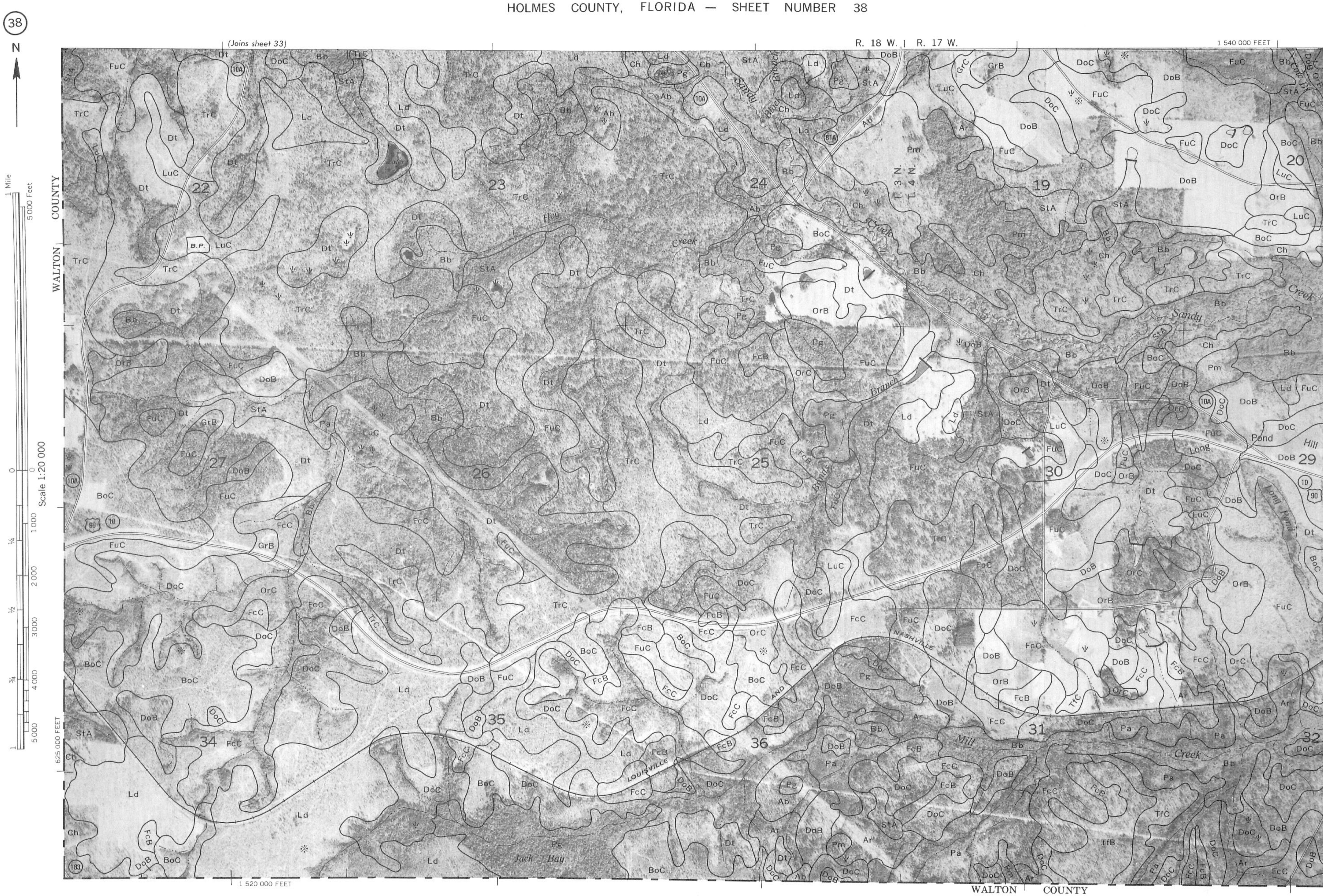
This map is one of a set compiled in 1972 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, and the University of Florida, Agricultural Experiment Stations.

2,000 and 5,000-FOOT GRID TICKS

N



This map is one of a set compiled in 1972 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, and the University of Florida, Agricultural Experiment Stations.
Photobase from 1969 aerial photography. Positions of 5,000-foot grid ticks are approximate and based on the Florida Coordinate system, north zone.
Land division corners are approximately positioned on this map.



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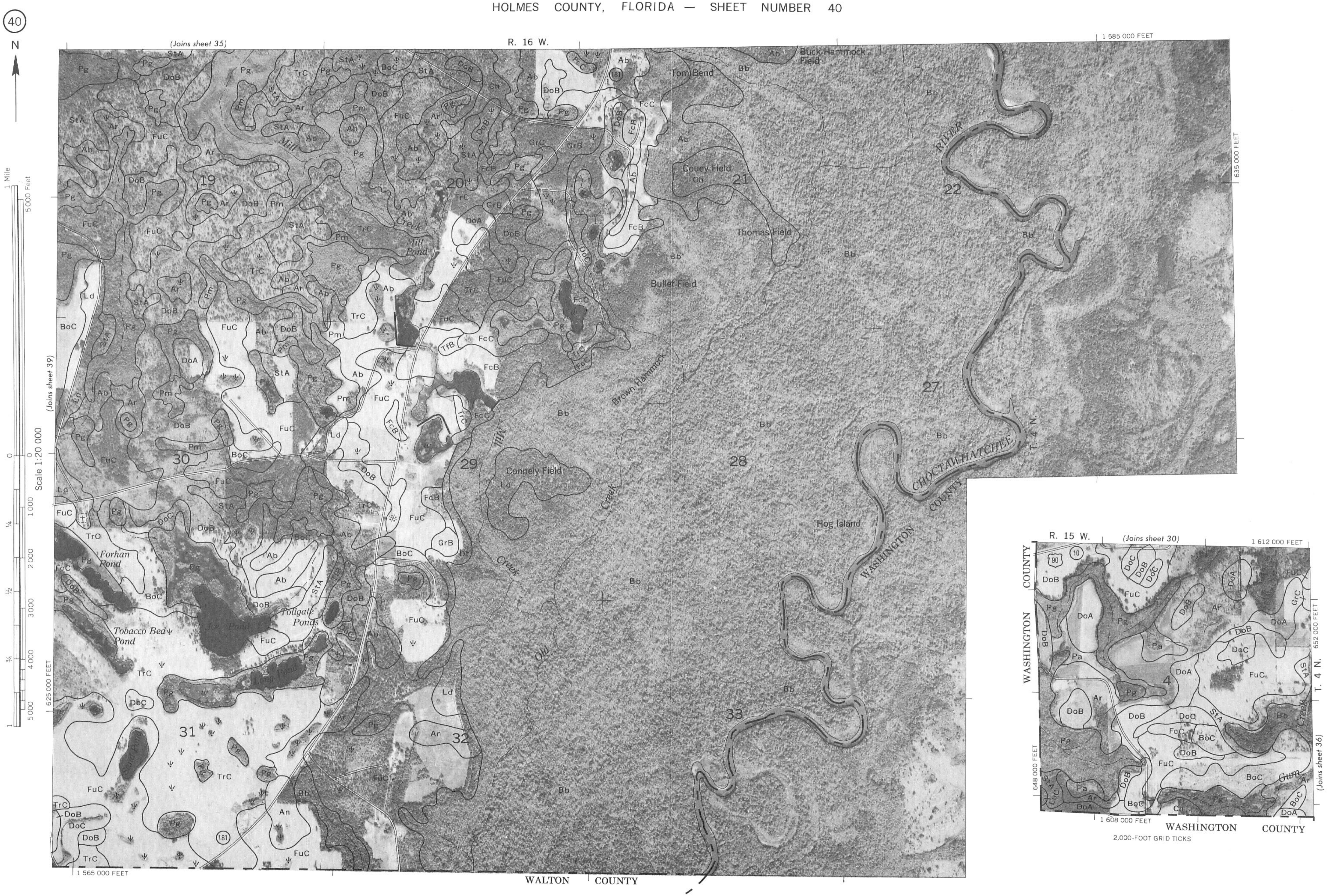
Land division corners are approximately positioned on this map.



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